The School Arts Magazine

AN ILLUSTRATED PUBLICATION FOR THOSE
INTERESTED IN ART AND INDUSTRIAL WORK

PEDRO J. LEMOS, *Editor*

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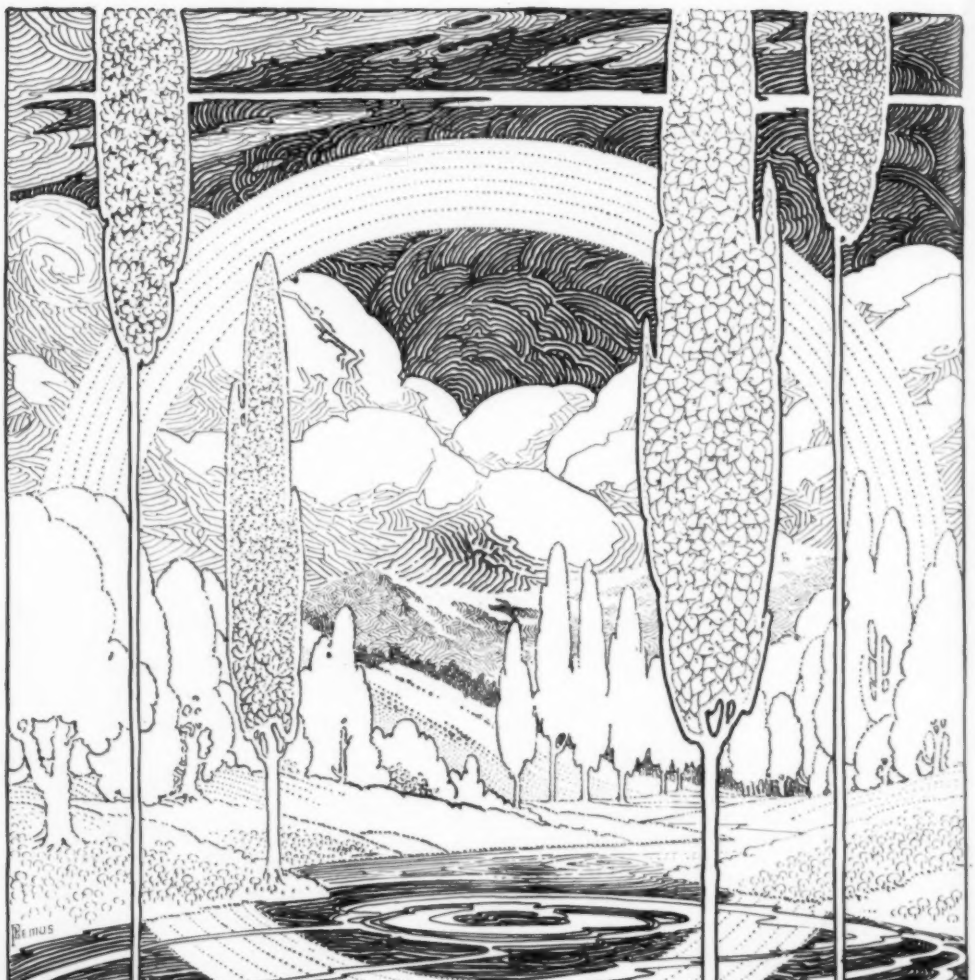


O beautiful rainbow; all woven of light!
There's not in thy tissue one shadow of night;
Heaven surely is open when thou dost appear
And, bending above thee, the angels draw near,
And sing - "The rainbow! the rainbow!
The smile of God is here"

Sarah J. Hale

THE SCHOOL ARTS MAGAZINE

VOL. XIX. No. 10 JUNE 1920

Symbolism of Color

HENRY TURNER BAILEY

Director of the Cleveland School of Art

"FINE Art," said Hegel, "is the free and adequate embodiment of the Idea in a form peculiarly appropriate to the idea itself"; and fine art in school work is no exception. The thoughtful teacher, guiding his thoughtful pupil will find coiled up within the "Idea" of any project all he needs to know as to kind of material to be used, plan, structure, ornament, and technique, in order that the result may be a bit of fine art. The thoughtless worker seldom produces a fine thing, for he never goes deep enough into the subject to discover what constitutes a "peculiarly appropriate" form. His output, therefore, is monotonously uninteresting and insignificant.

Hegel's definition furnishes also the key to artistic color effects. In these days everybody makes use of color, but few use it intelligently. If asked why this colored paper was used, or that color applied to it the answer is likely to be, "We had it on hand; I like that color." That may be economical and comfortable, but it does not make for fine art. It pays to put one's best thought into a problem every time, even in the matter of color. Color is significant. "The colors that the earth exhibits to our eyes are manifest signs of those who think," said Mohammed; and the colors used in school work should be. They should never be fortuitous or chaotic. The coloring may be imitative, suggestive, or symbolic, but in any case it should be significant.

I. Imitative coloring belongs to the realm of the painter, the illustrator, and the craftsman whose aim is naturalistic effect. In that realm grass is green and skies are blue, lips are red and eyes are brown. Imitative coloring is a subject to be treated by itself, and not within the scope of this brief article.

II. Suggestive coloring belongs to the realm of the decorative artist. The aim is to produce a color effect appropriate to the occasion. For example, if your school color is blue, the program for a glee club concert given by the pupils might be blue; not necessarily bright blue, but so designed that blue is the dominant note,—white paper with blue ink, a delicate tint of blue for the paper with text in darker blue. Or, if the students are in for a farce or a frolic of some sort, dark blue paper and white ink would be appropriately odd. An Arbor Day program might be designed in greens; a window card advertising lamps might be done in light orange and dark gray-blue, the colors of lamplight and shadow; a circular advertising bamboo goods in dull yellow and brown, the bamboo colors. This is also a big subject and not to be treated here. In passing it may be well to say that it is necessary to draw a rather sharp line between the suggestive and the imitative in art, for the imitative may pass

over into the deceptive and the substitutive. For example, in printing for a copper merchant, an inartistic, ignorant printer, not content with copper-color ink, prefers the actual metal—uses copper bronze. Instead of using the wood colors suggestive of his craft, the ambitious carpenter sometimes forces his printer to give him a business card on actual wood veneer; and the glue manufacture has cards of isinglass! A business card should be a card. Good art accepts its limitations gracefully and even rejoices in them as furnishing incentives to more praiseworthy achievement.

III. Symbolic coloring belongs to the realm of the initiated, to the masters in every art. Chinese teachers, Indian mystics, Persian poets, Egyptian priests, Hebrew prophets, Grecian bards, Italian painters, English novelists, and American decorators, have all used, with astonishing precision, a sort of universal language of color to express their deeper meanings, the truths of religion, the intents of the heart. The masters in every art in every nation have had an abiding faith in that which Swedenborg calls "correspondences,"—the innate, inevitable relations of outer and inner, form and content, sign and thing signified.

For example, white and black have always been the symbols of day and night, of light and darkness, of purity and pollution. In Thibet, India, Java, China, Persia, Mexico, and Scandinavia white is the symbol of divine perfection. It is worn by the sovereign pontiffs of all religions. In Egypt a black dove was the symbol of widowhood. In the Greek mythology Apollo turned the white raven black for bringing news of the unfaithfulness of Coronis. Black was the color of the sails which took the expiatory ship to the Minotaur. Black has been the color worn for mourning since the days of the Roman Republic. The old Byzantine painters made the Madonna's face black, that it might say to every observer: "Is it nothing to you, all ye that pass by? Look and see if any sorrow is like unto my sorrow which the Lord hath done unto me." The Kaaba at Mecca "was originally white, but has been turned black by the sins of mankind."

Black and White have been used so long as merely the conventional colors of ink and paper that ordinarily they mean nothing unless by some device the attention is drawn to them. For example, by using bold-face type of the most formal sort, combined with heavy brass rule, black may be made so emphatic an element in a printed card that the card becomes an obituary notice. The appropriateness of white for certain things, like legal documents, letters of introduction, visiting cards, and so on, becomes evident the moment any other color is proposed as a substitute.

The mingling of light and darkness in half light—as in the cloudy day, the gloaming, and in the dull winter landscape results in such colors as gray and brown, the colors symbolical of loss, sadness, and mournful retrospect. The monastic orders wear these somber hues. The Quakers wear gray as a protest against luxury, gayety, and ostentatious display. "Sackcloth and ashes" have ever been the Hebrew symbols of sorrow and despair. Brown and gray, the colors of the barren earth and of leafless trees, are also the symbols of withered hopes, of self-renunciation. They must

be neutral to be recognized as symbols. If they have too much color, they appear as shades of reds and blues, which convey,rightfully,other meanings.

In commercial design, brown and gray become the appropriate colors for the covers of dignified documents of all sorts—reports of committees, books of statistical information, and other things of an unobtrusive and formal character. Here, as in all other cases, it is the use of the color as the dominant note that makes it significant. Of course any colors may be used in a secondary or subordinate place, merely as foils for the dominant color, or for harmony in decorative effect.

Yellow is the color of gold, and gold, the royal metal, is the symbol of the sun. The sun, worshiped as Indra, Amun Ra, Baal, Zeus, Odin, and the rest, was for the masses God, but for the initiated the symbol of God, the supreme wisdom. The Magi painted the sun's "house" yellow. One of the epithets of Vishnu, the first emanation from God, is "Wearer of the Yellow Robes." Apollo was—

> God of the golden bow
> And of the golden lyre
> And of the golden hair
> And of the golden fire.

The Argonautic expedition was for the golden fleece—wisdom. Horus of the Egyptians ("The Word" of St. John, the "Wisdom" of Solomon) was born in the golden heart of a lotus. The golden apples Hercules fetched from the garden of the Hesperides symbolized wisdom, like the golden apple of Eden, "pleasant to the eyes." The Golden Rule is supreme wisdom. The streets of the New Jerusalem are pure gold for they are Wisdom's ways; and the four and twenty elders are crowned with gold. The old masters often gave Joseph a yellow robe, because of his wisdom in obeying the angels.

Orange is the color of flame. What the sun is in heaven, fire is upon earth. If the sun stands for the unattainable divine wisdom, fire stands for the attainable human wisdom. To make man nearer the perfection of the immortal gods Prometheus gave him fire. The flame, the torch, the lamp—these are the form symbols of knowledge; orange, flame color, is the corresponding color symbol. When Vishnu first appeared in human form, he was the color of flame. When the wisdom of God came to Moses in the wilderness, it appeared as a burning bush. When the Spirit, who was to lead into all truth, came to the disciples at Pentecost, there appeared a flame of fire above the head of each of them. In the old, old days a marriage meant a new hearth fire, hence orange is symbolical of marriage. When Helen was to be married a second time, she brought

> A Veil
> With saffron-hued acanthus broidered round,

which her mother Leda gave her at the time of her first marriage. She hoped this orange-hued veil, the symbol of lawful wedlock, would bring her good luck in her unlawful marriage to Paris. Because the hearth fire is the center of hospitality, orange is the symbol of benevolence—the spirit that does good deeds wisely. The Renaissance painters give the benevolent saints like Catherine and Barbara orange robes.

Red means the blood, the fire of the heart. It is the universal symbol of love. "Red," says Plutarch "is consecrated to all the deities." The high

priests of Hieropolis, Eleusis, and Samothrace wore red. Constantine's Banner of the Cross was blood-red, like the oriflamme of France sent from heaven to Clovis, because "the love of Christ" constrained them. The third of Dante's purgatorial stairs was red, for love was the third phase of repentance. Maud's lover says her footsteps would rouse him had he lain for a century dead; his dust

> Would start and tremble under her feet,
> And blossom in purple and red.

In mediæval art Saint Mary Magdalene wears a red robe, for she loved much. Saint Cecilia's garland is of white and red roses. The Madonna is clothed in red and blue, for love and constancy.

Green is the color of the fruitful earth; hence it is the color which signifies fertility, abundance, prosperity. Vishnu in his third revelation in the actions and customs of life was green. The Greeks gave the sea deities green robes, because they controlled the teeming "unharvested" sea. Freya, the Scandinavian Venus, was green. The Bible likens the righteous man to a green tree, whose leaves do not wither. To the daughters of Jerusalem Jesus said: "Weep not for me, but weep for yourselves and your children. . . . If they do these things in a green tree, what shall be done in a dry?" In the early Christian and Byzantine Art, and frequently in the art of the Middle Ages the cross was represented as green, because of its potency. Green celebrates victory over the winter of death; hence martyrs carry green palms, and the smilax about the face of the dead whispers of the eternal spring.

Blue is the color of the sky, which, like truth, endures forevermore. Nothing permanently changes the face of the sky. "We can do nothing against the truth," says Paul. In Egyptian mythology the creator of the world was Cneph, the blue sky. Vishnu, the Truth, was blue when born. The elders of Israel saw that the throne of Jehovah rested upon "a paved work of sapphire stone, like the body of heaven in clearness," for truth and justice are the foundation of his throne. Because all stable human character rests on truth and sincerity, Jehovah exclaims, "I will lay thy foundations in sapphires." A beetle of blue stone ornamented the rings of Egyptian soldiers, as a symbol of their oath of fidelity. Blue was the favorite color of the Scotch Covenanters. When their army entered Aberdeen, almost every man of them wore a blue ribbon. Some men are "true blue"; and when in doubt we ask

> Honest and true,
> Black and blue?

The old masters gave the Virgin a blue robe and John a blue tunic for constancy.

Violet is made of blue and red. It is the color of truth touched with passion and love. "Hyacinth," says Epiphanus, "placed in a fierce furnace, is unaffected, and even extinguishes it." Because of universal belief in that statement, perhaps, lies the reason that the mediæval painters gave violet robes to the martyrs. Violet is the color of shadows, and is associated with "purple evening," and with the valley of the shadow of death. According to the Greeks, the Elysian fields are sprinkled with asphodel. The bank that witnessed the first sin in Eden, says Milton, blossomed with violets and purple asphodel. Violet is the mourning color of China. When Queen Victoria died, the British

Empire was draped in violet, not in black, because the Prince of Wales was living. Black is hopeless; violet means mourning but not without hope. In Christian art the penitent Magdalene wears violet.

All these colors have a sinister meaning, with which the beginner need not often trouble himself. It is enough for him to know that in his daily work he may use them as Moses was commanded to use them in the Tabernacle, "for glory and for beauty." Orange is peculiarly appropriate for Thanksgiving, red for Christmas, and green for Easter printing. The sayings of the wise poets should be in yellow, and of the wise philosophers in blue. Each is appropriate in its time. Stated concisely and in tabular form for ready reference the Symbolism of Color is as follows:

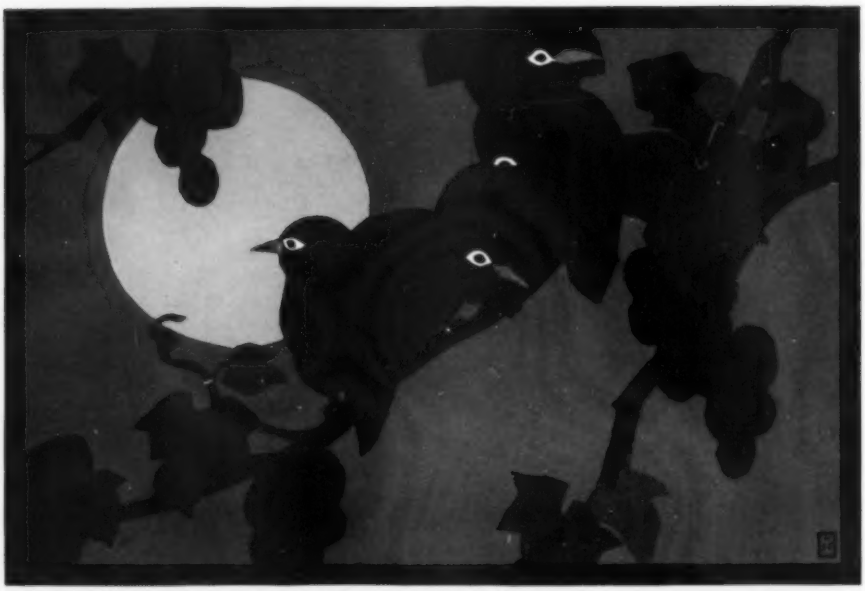
SYMBOLISM OF COLOR

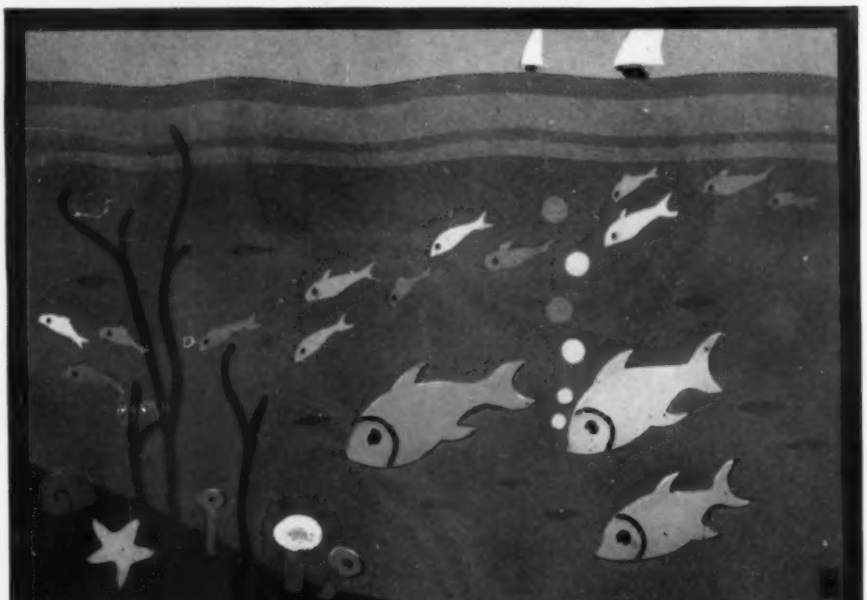
Auspicious	*Sinister*
WHITE: Day. Innocence; Purity; Perfection.	BLACK: Night. Despair; Evil; Sin; Death.
BLACK: Grim Determination.	WHITE: The Spectral; Hypocrisy. Treachery
YELLOW: Sun, Supreme Wisdom; Highest Values. Divinity	
ORANGE: Fire, Earthly Wisdom; Marriage; Hospitality; Benevolence. The Holy Spirit	Malevolence; Satan
RED: Blood. Love; Valor; Patriotism. The Christ	Passion; War; Anarchy
PURPLE: Royalty; Love of Truth; Loyalty; Martyrdom	Mourning; Regret
BLUE: Sky, Truth; Constancy; Justice; God the Father	Doubt; Discouragement
GREEN: Vegetation. Fruitfulness; Prosperity; Hope; Life. Immortality	Envy; Jealousy
GRAY AND BROWN: Winter, Barrenness; Unfruitfulness; Penitence; Renunciation	

The teacher who knows something of this rich legacy bequeathed by the masters of the past, and who loves his work and puts his best thought into everything he does, is the teacher who helps most and whose pupils will produce the best work. Such teachers will help to lift American Art out of the commonplace. "It is the *intention* of the artist, not his adequate copying," says John La Farge, "that makes us understand him." The larger his intention, the more he includes, the more we feel the magic of the wand, and enjoy the work of his hands.

THE PUREST AND MOST THOUGHTFUL MINDS
ARE THOSE WHICH LOVE COLOR THE MOST.
—*Ruskin*

HARMONY BIRDS THAT CAN BE OUTLINED AND COLORED. THE CHILDREN CAN THEN FASTEN THEM ONTO A TREE TWIG BY PASTING THE STRIP OF PAPER BELOW THE FEET AND WRAPPING IT AROUND THE TWIG. THIS WILL TEACH THEM THE HARMONY COLOR COMBINATIONS





CUT PAPER PICTURES AS A COLOR PROBLEM FOR THE GRADES PRESENT POSSIBILITIES FOR THE PUPILS TO CHOOSE COLOR HARMONIES AND ARRANGE THE SUBJECTS WELL, BEFORE THE PASTING IS FINISHED. FROM THE BOOK "APPLIED ART," BY PEDRO J. LEMOS. PUBLISHED BY THE PACIFIC PRESS PUBLISHING ASSOCIATION, MOUNTAIN VIEW, CALIFORNIA

The Interests of Children of the Primary and Intermediate Grades in the use of Color

W. C. REAVIS
St. Louis, Missouri

THE following study is an attempt to find out the primary interests of children of the lower grades in the use of color. It deals with three questions: (1) In what colors are children of the primary and intermediate grades most interested? (2) In their undirected representations, do they give major consideration to accuracy of representation, or to playing with favorite colors? (3) In following their own initiative, do they make use of color primarily as a means of representation, or for the pleasurable sensations derived?

In order to ascertain with some degree of certainty the colors that give children the most delightful sensations, the following test was arranged. Colored squares of paper were prepared, representing each of the spectrum colors, and sets were given to each child of the first three grades to mount in the order of his preference. The pupils of the fourth and fifth grades were given the spectrum colors, and after they had used them, each one was asked to designate his favorite color and his second choice. Tables of frequency were compiled from these data, and the results are shown in surfaces of frequency in Chart I. An examination of the date for the first three grades showed that it was not worth while to compute table beyond the second choice. Color as the expression of a third, fourth, fifth, or sixth choice was merely a perfunctory matter.

In the surfaces of frequency of Chart I, the first-and-second-choice colors of 74 children of the first grade, 50 of the second grade, 60 of the third grade, 42 of the fourth grade, and 39 of the fifth grade are given. The ordinate shows the percentage of children, and the abscissa the spectrum colors in the following order: red, blue, yellow, violet, orange, green. Figures 1 to 5 inclusive show the favorite colors of the first five grades respectively; and Figures 6 to 10 inclusive show the second-choice colors of the same pupils. The curves indicate that red and blue are the colors in which the large majority of children are most interested. However, the color interests of the children of the intermediate grades appear to have widened.

There was no doubt regarding the expression of individual choices of colors by the pupils of the fourth and fifth grades in the foregoing test. However, as the pupils of the first, second, and third grades did have an opportunity to see how other pupils of their grade arranged the colors, it was thought that they might have been influenced to some extent by imitation. Hence, as a check on the validity of the results obtained from these grades, thirty children of the same grades in another school were given the same test, individually. The surfaces of frequency obtained by compiling the choices of this group were then compared with the surfaces of frequency obtained by com-

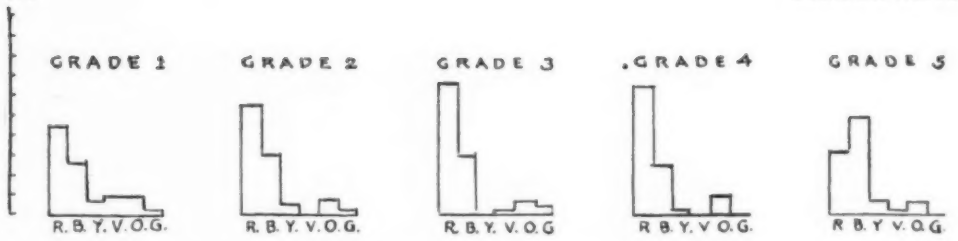
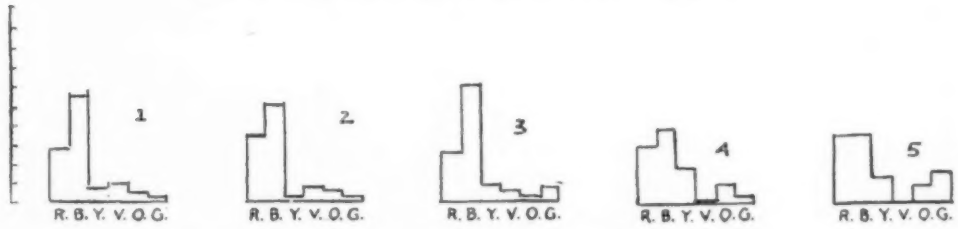


CHART I. Favorite colors of first five grades



Second choice colors of first five grades

bining Figures 1, 2, and 3 of Chart I, and likewise Figures 7, 8, and 9, when it was found that the curves were almost identical. These curves are shown in the following Chart II in which Figure I gives the distribution of the favorite colors of the group of thirty children, and Figure 2 shows that of the composite group; while Figures 3 and 4 show the distribution of second-choice colors of the same groups respectively.

Hectographed outlines of birds were next given to the children with the instructions that they were to fill in the outlines just as they pleased. The birds chosen for the test were those common to the vicinity. In fact, they were seen daily in the trees on the school ground, and were the subjects of nature study lessons several weeks before the tests were given. All of the pupils recognized the birds, as was ascertained by holding the outlines before the class, before giving them to the children with the instructions mentioned above.

Figures 1 to 5 of Chart III show the way in which the outlines of the bluejay were colored by the pupils of the first five grades, respectively. The abscissa indicates the percentage of children, and the ordinate the following colors (reading from left to right): red, blue, yellow, brown, any combination of two different colors designated in the chart by M, and conglomerate mass of colors.

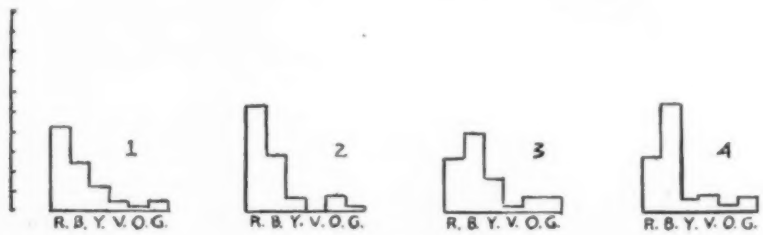


CHART II.

Chart IV shows the coloring of the outlines of the woodpecker, and is similar in every respect to Chart III, as is Chart V that follows, which shows the coloring of the outlines of the English sparrow.

A careful examination of the data shown in Figures 1, 2, and 3 of Charts III, IV, and V reveals several interesting facts regarding the use of color by the pupils of the primary grades: (1) A considerable number filled in the outlines without manifesting any concern whatever in exact representation, as was evidenced by the indiscriminate use of all the colors of the spectrum in painting a single bird. (2) Some of the children seemed to take a cue from the most striking detail, and filled in the outline with that color only. For example, they colored the jay with a single shade of blue and the woodpecker red. (3) Another group made serious attempts at truthful representation, indicated by their attention to the proportions of the different details. However, their interest in strong color seemed to have caused them to err grievously in the choice of colors necessary to make even the semblance of a truthful representation.

The work of the fourth and fifth grades differed markedly from that of the lower grades, although a few of the pupils appeared to be just as erratic and indifferent to correct results as the younger children. (1) A majority of the pupils made use of tones of color in representing a bird, a fact that was not observed in a single drawing of the primary children. (2) The pupils of the intermediate grades, excepting the erratic ones referred to above, consumed much more time in filling in the outlines, thus showing the presence of external standards in contrast with the spontaneity and absence of standards in the minds of most of the children of the first three grades. (3) The intermediate-grade pupils greatly increased their percentages in the selection of correct colors, and in attention given to

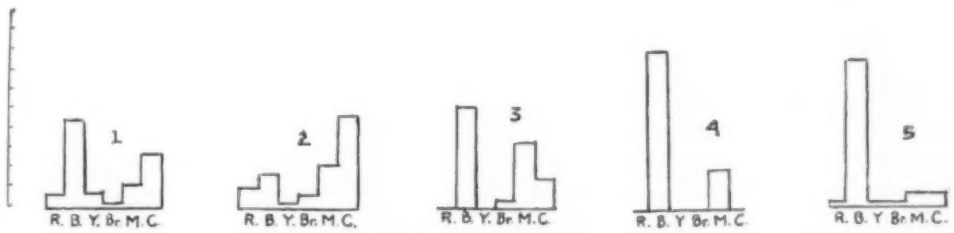


CHART III. Blue jay coloring by children of the first five grades.

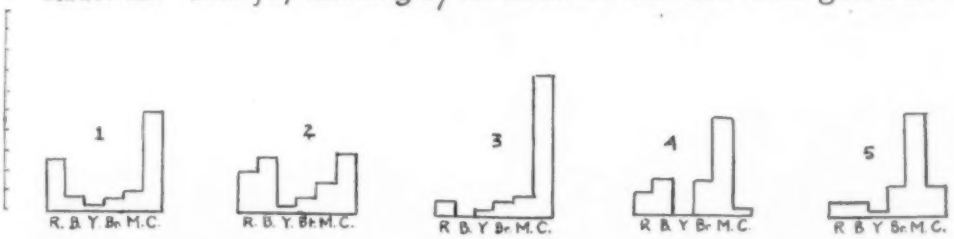


CHART IV. Blue jay body, wings and tail coloring by first five grades.

CHART V. English sparrow coloring by children of first five grades

details, as is shown by the surfaces of frequency in Charts III, IV, and V, and in Chart VI that follows.

Chart VI was compiled from the drawings of the woodpecker shown in Chart IV. The ordinate gives the percentage, and the abscissa the following details (reading from left to right): head, bill, body, wings, tail, feet. The woodpecker was chosen for the reason that its details are most marked, and it had been closely observed by the classes in their nature-study lessons several weeks before the tests were given.

The surfaces of frequency for the pupils of the first three grades point out that only the most significant details were represented with any degree of accuracy. Even these were ignored in many instances by children who apparently became intoxicated with the bright colors they were permitted to use in free and undirected play. With the fourth and fifth grades the drawings were altogether different. They represented significant details with great accuracy, and truthfully portrayed the minor details in almost 50 per cent of the cases.

Another noticeable fact in the drawings was the relative development of the power to grasp and give attention to details as the pupil advanced through the primary into the intermediate grades. This appeared to be the rise of a new interest in more exact representation due to the consciousness of an objective standard of form and color appropriateness resulting from age readjustments, and instruction. This observation was further corroborated by the data shown in Chart IV, in which the grosser errors tended to disappear as the pupils advanced; shown by the facts that 55 per cent of the pupils of the first and second grades, and 21 per cent of the third grade colored all parts of the bird the same, while only 12 per cent of the fourth grade and 9 per cent of the fifth grade committed the same error.

A different situation was presented in the next test. The pupils were asked to paint a sled. The teachers refrained from giving any directions or suggestions, and the children had to rely upon their own initiative for the selection of color, and the form they were asked to represent. The results are shown in Chart VII, in which the ordinate shows the percentage, and the abscissa the following colors: red, blue, yellow, any of the secondary colors, brown or black, conglomeration of colors.

Excepting two facts, the results of the above test do not differ essentially from those of previous tests: (1) The decrease of red as a leading color in the first two grades and the large use of neutral were certainly the result of a complication of the problem of form

with the free use of color. Favorite colors seemed to be forgotten by many of the pupils in their efforts to meet the requirements of form, and as a result they reacted in the way they had been taught to react in drawing objects, i. e., by employing light and dark. Some left the drawing simply in outline done in black or brown pencil, thus showing that the problem of form had deprived them of the pleasure accruing from a free use of color; while others proceeded to fill in the outlines with the color or colors that pleased them. (2) The decrease of the use of blue by all pupils, especially those of the third, fourth, and fifth grades, was evidently due to psychological reasons. Blue is a color of rest while red is a color of action. Therefore, the association of a color of rest with the drawing of a sled, which suggests one of the favorite and most active sports, could hardly be expected.

Without taking into consideration the pedagogy of color in relation to the art work of our public schools, we believe that this study at least warrants the following answers to the questions at issue: (1) Children of both primary and intermediate grades are interested in strong colors, chiefly red and blue. (2) The majority of children of the primary grades are interested more in the sensations derived from a free use of color, than in exact representation. They paint with great freedom, and apparently take little interest in the perfection of details. On the other hand, most of the children of the intermediate grades draw with less freedom but pay greater attention to accuracy of details, and manifest greater interest in the character of their results. They seem to realize the importance of objective standards, and put forth serious efforts to master the external facts that lead to a realization of their standards. (3) The interest of most children of the primary grades centers around sensation, while the intermediate-grade children appear to employ color primarily for purposes of representation.

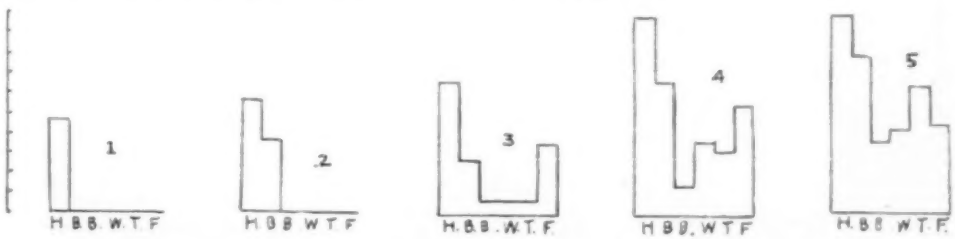


CHART VI. Head, bill, body, wings, tail and feet coloring by first five grades.

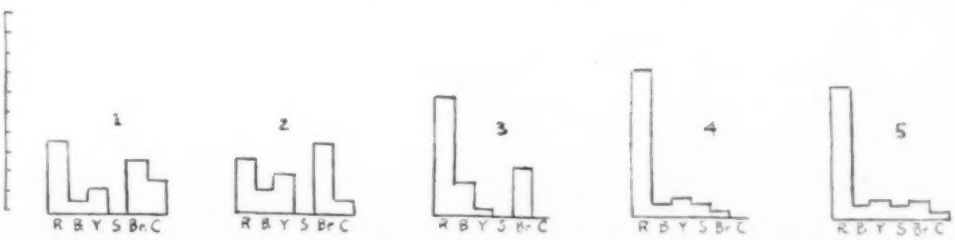
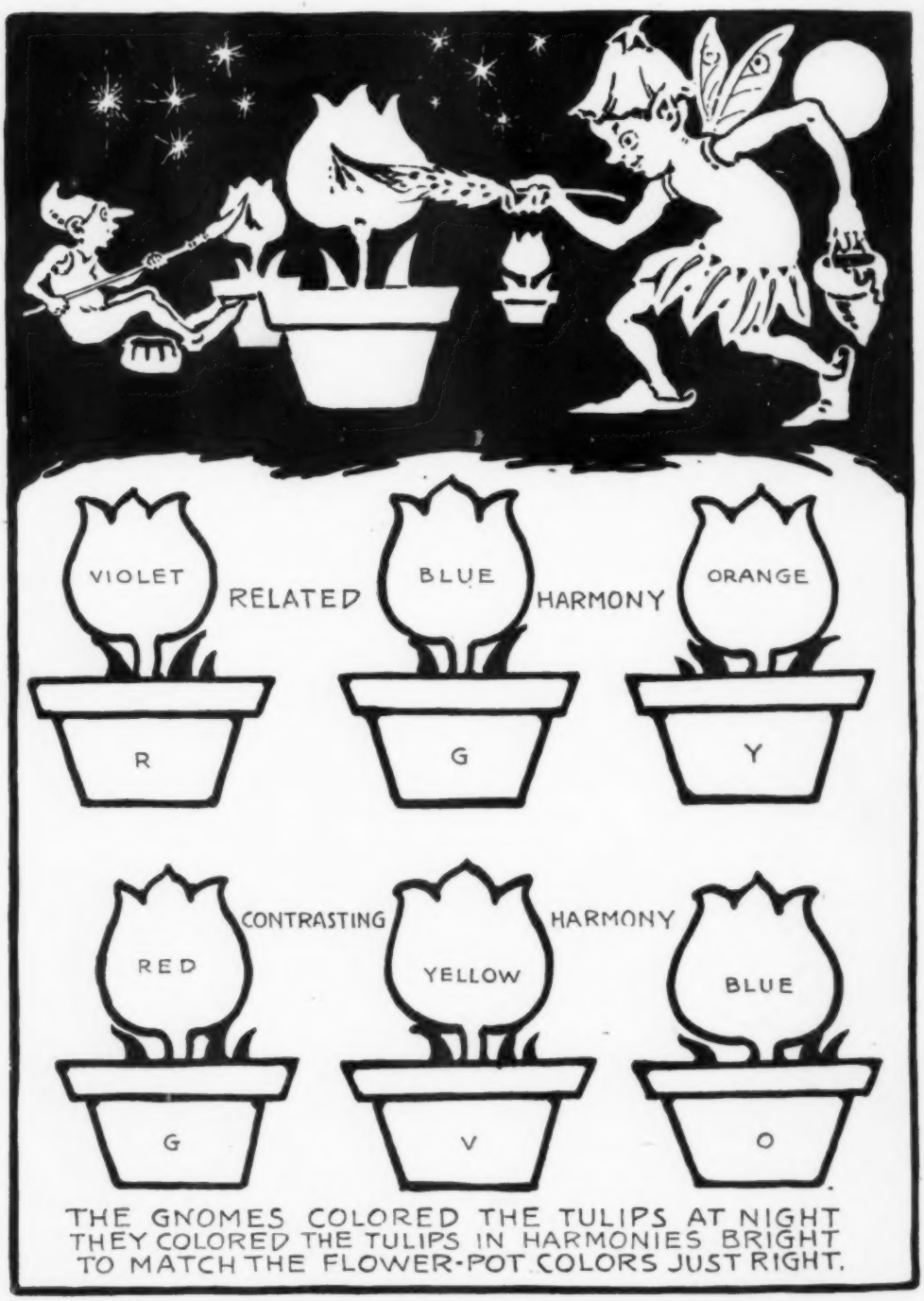


CHART VII. Colors used by the first five grades in painting picture of sled



HAVE THE PUPILS CUT OUT TULIPS AND FLOWER POTS FROM DIFFERENT COLORED PAPERS AND COMBINE THEM IN GOOD HARMONIES. ALSO HAVE THE TULIPS AND FLOWER POTS IN OUTLINE SO THAT THEY CAN PAINT THE PROPER HARMONIES

FOLD
NEST FORM
SHADED PORTION TO BE PASTED
THE BUNNIES WILL HOLD THE EGGS SIDE BY SIDE
Two Bunnies should be cut out of stiff paper
A nest to hold the eggs
WHICH COLORED EGGS WILL LOOK BEST TOGETHER
SIX COLORED PAPER EGGS
MAGIC COLOR BALLS
THE GREEN AND RED BALLS WILL MAKE EACH OTHER APPEAR BRIGHTER. WHAT OTHER COLORS WILL DO THE SAME?
RED
GREEN
DARK LINE CUT TO INSERT COLOR BALL
CUT THE FIGURES ON FOLDED PAPER TO MAKE FIGURES STAND

TWO OTHER COLOR HARMONY PROBLEMS TO INTEREST LITTLE ARTISTS. ONE IS THAT OF TWO EASTER BUNNIES AND THE OTHER IS TWO LITTLE ALADDINS WITH MAGIC COLOR BALLS

Color Charts for the School Room

JOHN T. LEMOS

Polytechnic High School, San Francisco, California

COLOR is always fascinating. The study is so far-reaching in its scope that it is a practically limitless subject. It has so many angles that one can go on and on like Tennyson's brook without ever stopping.

Every once in a while someone discovers a new thing about color, or establishes a new theory and then some of us decide to start the study of color all over again. Some teachers of color adopt every new theory that comes along, and the result is generally a bewildered class and oftentimes a bewildered teacher.

The idea in this article is to bring out and make simple a color theory that is as "old as the hills" and yet one which, from a practical standpoint, has not failed yet. Many color theorists expound ideas that are beautiful to hear about, or which are successful when displayed with a prism and light rays, but which from a practical viewpoint of color and pigments, will not work out.

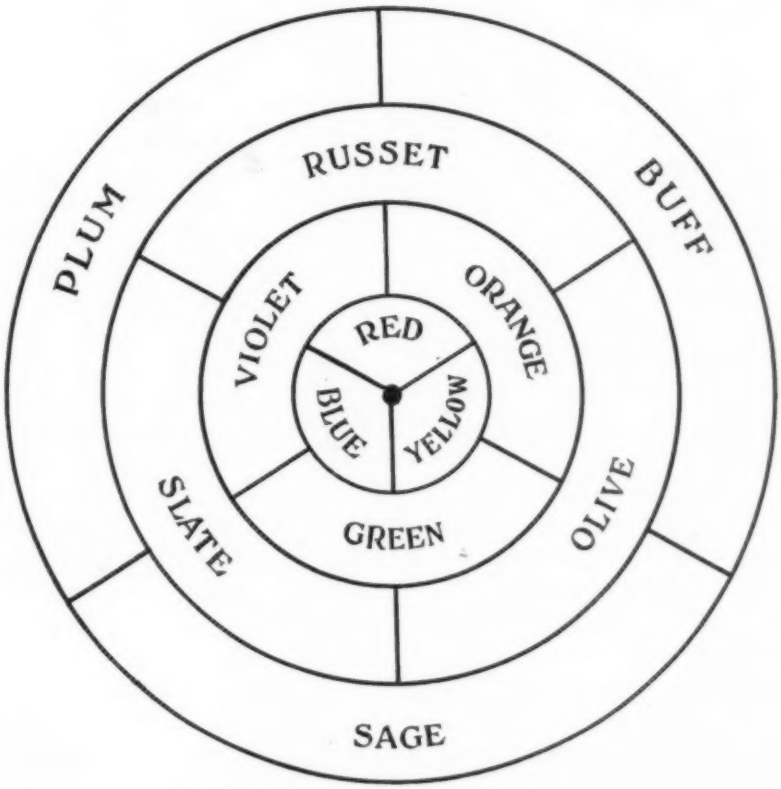
The color scheme we wish to talk about is the old one that says yellow, red and blue are the three primary colors and by using these three as a basis all the other colors may be worked out. We like this theory because engravers, commercial artists and printers have used it with good success and so far no one has come forward with a theory which in actual practice can improve it.

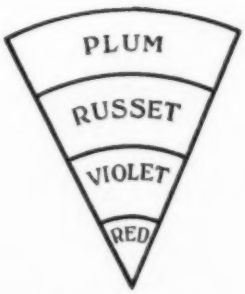
By a series of color filters, the engravers are able to make plates which will in three printings of yellow, red, and blue, give us all the colors found in nature. Sometimes a fourth plate of black is added to give the picture the gray tones. If you will take a good magnifying glass and look at the color prints you will find in this magazine, the little dots of yellow, red, and blue can be seen running all through them.

Based on these same three colors, many of the interior decorators have adopted a color chart similar to the wheel found in the first illustration. Everyone who uses it finds it successful. Many art teachers are using this chart in their classrooms and find it a big help in making the study of color easier. A large copy of this wheel done in the proper colors and hung up in the front of the room will make itself useful many times through the day.

If you will look at the chart you will find that it starts in the inner circle with the three primaries—yellow, red, and blue. The second circle contains the secondary colors made by combinations of the primaries, and the third contains the tertiary set of colors. The location of the colors on the chart not only shows how the colors are made but also helps the artist to figure out good color schemes. This last point is the best feature of this particular chart.

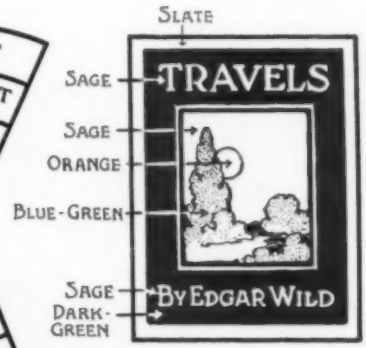
All the artist needs to do is to take the colors found in any of the pie-shaped sections, as shown in the first illustration, and use them together in a color scheme. In this case, he will find he is





A Color Scheme of Related Hues obtained from the Diagram.

Contrasting Colors obtained from Triangles opposite each other.



Showing how the Color Scheme on the left could be used on a Book Cover.

A CHART THAT SOLVES GOOD COLOR COMBINATIONS

using what are known as related or analogous colors. These colors all have to a greater or less extent some common color running through them, as in the case of the pie-shaped section containing red, orange, and russet. The common color here is red.

If the artist wishes to obtain a color scheme which has snap and contrast in it, all he needs to do is to use the colors in the pie-shaped sections that lie directly opposite each other. The ability to select the correct combinations of complementary colors is often lacking in many students, but in this chart they find it a simple matter. The only thing that should be avoided in this case is the use of colors which are opposite each other in the inner circle, as a contrast such as red and blue would be too harsh.

By looking at the chart the student also learns how various colors are mixed. He sees that orange is made up of one part of yellow and one part of red; that russet is made up of one part orange and one part violet, etc. It is surprising how many students there are who become confused when they are asked to mix up colors beyond the secondaries, such as brown, sage, buff, etc.

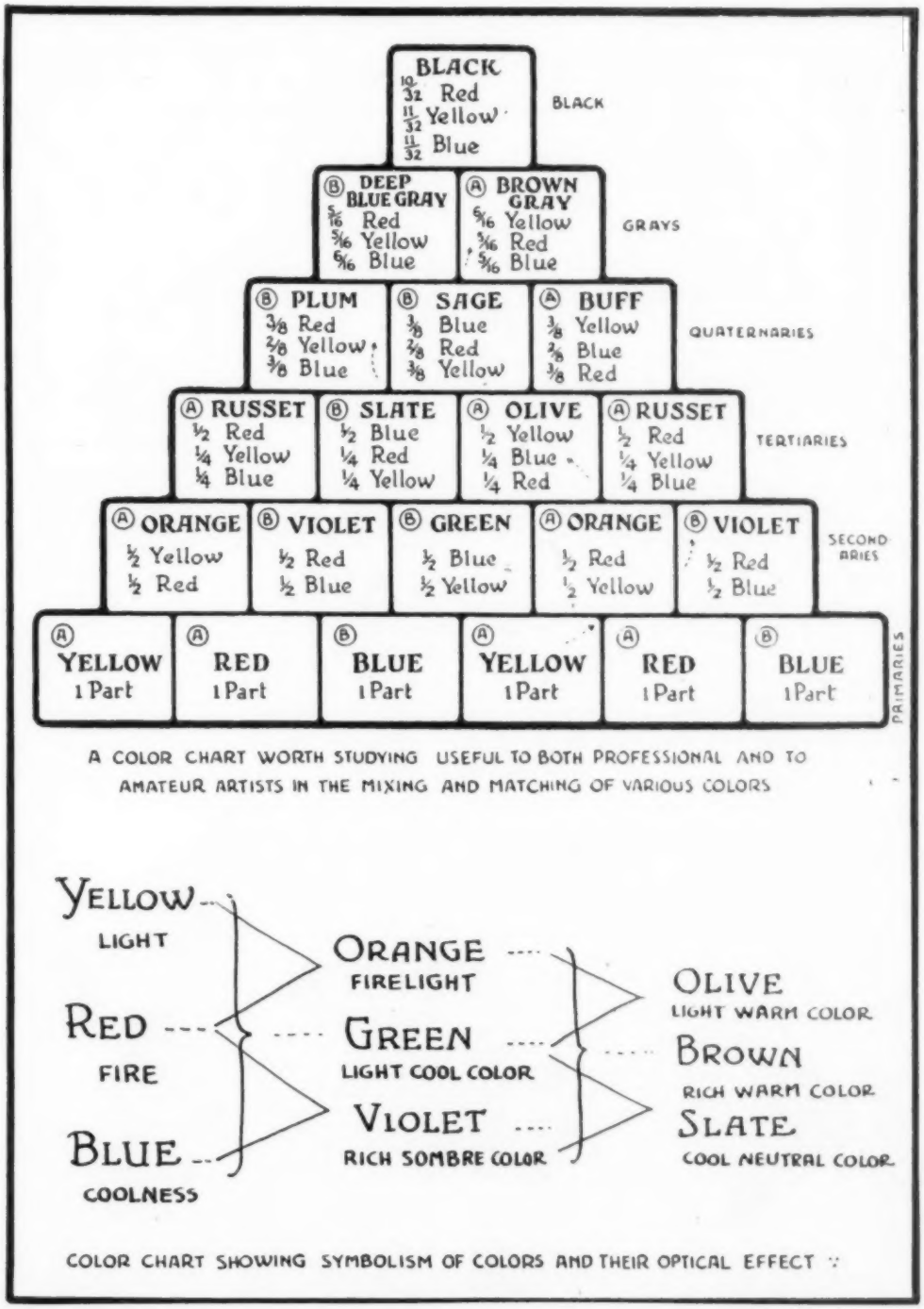
In class work, teachers of subjects such as design and poster work will find such a chart extremely valuable. It helps students to figure out color schemes for themselves, instead of calling so much upon the teacher, as is generally done. In addition to helping the student figure out the *kind* of colors to be used, the chart also helps to figure out the *amount* of each.

For instance, in looking at the color wheel we find that in the triangle selected, the area covered by the color marked *plum* is seven or eight times as large as that marked *red*. In planning out a design or poster the pupil should figure on using plum in the larger areas and red in the smaller ones. The reason for this is easy to understand when we realize that the colors in the outer rim are much grayer and less intense than those in the inner circles. So the chart automatically works out a rule much used by designers which says: "The smaller the area, the *brighter* the color; the larger the area, the *grayer* or *softer* the color."

While working on this idea, it would not be a bad plan to also put on the board the small diagram, shown at the bottom of the second illustration, which gives the symbolism of colors. This little diagram also shows how the various colors are mixed, but its main value lies in the fact that it gives the student something of an idea of the particular kinds of colors that are appropriate for certain designs.

While many students know quite a bit about color, they often select their colors with no consideration of the adaptability of the color to the subject being colored. They are just as apt to use orange, tan, and brown for a winter scene as they are for an autumn picture. Professional artists and advertisers count a great deal on the optical effect of colors and plan their work accordingly, so that the sooner the color student learns to do the same the more certain he will be of producing successful work.

A third chart, and one which should be studied to be really appreciated, is shown at the top of the second page of charts. This chart is wonderful in its possibilities and the more you look at it, the more you will appreciate it. In



A COLOR CHART WORTH STUDYING USEFUL TO BOTH PROFESSIONAL AND TO AMATEUR ARTISTS IN THE MIXING AND MATCHING OF VARIOUS COLORS

COLOR CHART SHOWING SYMBOLISM OF COLORS AND THEIR OPTICAL EFFECT

COLOR CHARTS GIVE VISUAL COLOR HARMONIES SO THAT BY THEIR USE STUDENTS DEVELOP A DEFINITE COLOR KNOWLEDGE

reality it covers about everything an amateur in color would want to know and is a help to professionals as well. It starts down at the bottom with the primary colors and keeps building up until it finishes off with the deep grays and black. From this the student can see the transposition of the brighter colors to the softer and grayer colors of the spectrum.

In addition to showing how the colors are developed, this chart also shows just what proportion of each color must be used to make the color desired. Of course, some allowance will have to be made for the variation of colors in the various boxes of students, but the chart gives the students the right start. By looking at the chart we see immediately that buff can be made of ⅜ yellow, ⅜ red, ¼ blue. In other words, if the student took one part yellow, one part red and a little less than a part of blue, he would come pretty close to mixing up a good buff color. In the same way, any other color in the set may be figured out.

In the upper lefthand corner a little circle has been drawn with an A or a B lettered in it. All the colors lettered A are related or analogous to one another. All those marked B are related to each other. In this way we find that blue, green, slate, sage, and blue-gray are related.

If the artist wishes to obtain a combination of colors that have contrast all he needs to do is to combine a color which is marked A with one marked B. The farther up on the pyramid these colors are, the more certain the artist is of obtaining a pleasing combination of contrasting colors. If you use adjoining colors on rows next to each other, following a course similar to that shown by the light dotted line, you are sure of obtaining the most perfect contrasts.

Any of the charts shown here are not hard to understand. If any one or all of them are copied and used properly by students, they will more than repay both the pupils and teacher for the effort put out. Color charts like these, used in the schoolroom, are useful allies in the study of that interesting and often confusing subject, Color.

THE RAINBOW

MY HEART LEAPS UP WHEN I BEHOLD
A RAINBOW IN THE SKY:
SO WAS IT WHEN MY LIFE BEGAN;
SO IS IT NOW I AM A MAN;
SO BE IT WHEN I SHALL GROW OLD,—
OR LET ME DIE.

—*Wordsworth*

Color as Business Symbols

JAMES CHEESMAN

GRAPHIC art as expressed by printing has reached a very high mark in the present day. The higher uses of color in advertising have won their way to favor only recently, and if the crucial test of art be applied here, as in other fields of work, we shall learn why this is so. If, to entitle anything to rank with art products, it must first be true, then good, and finally beautiful, we may measure the art value of all work by these rules. To illustrate: let us select the advertising matter of a few large business houses. To what extent is it effectual in advertising service? Surely all advertising designs are intended to be realistic. The extent to which they are controlled by canons of art appears to be still an open question. It must be admitted that the highest embodiments of art in line and color are the most captivating in their appeals.

In formulating the principle of a color scheme the finer sense naturally turns to green as the broad base of the work. For the fullest expression of character every stage of a growing plant should be illustrated, and the range of color embraced should form the groundwork of the design.

Breakfast foods offer a most inviting field for work of this kind. The base of a color scheme in this line should be a combination of plant greens in at least three shades, each demonstrating a period of growth. Then, as the plant approaches maturity and takes on its yellow brown, the whole scheme exhibits definite power and harmony worked out in commercial form. Could we have anything more effective in persuasive selling power than an actual exhibit of a natural process?

The corn plant offers a wealth of color for advertising purposes, yet one of the finest products in cornmeal known to milling art is presented in a package of strange color in no way related to the contents. Only a few weeks ago two corn carnivals were presented by rival amusement companies in Chicago. One of these ventures showed no lack of enterprise in management, some of its advertising color schemes being especially effective.

The management of the corn festival in the other part of the city used for its announcements a black and brownish yellow scheme quite devoid of expression. The only explanation to be found in such discords is the utterly false concept which some persons have of color. It is too often answered that appreciation of the art quality is quite lacking in a promiscuous crowd of amusement-seeking people.

The best answer to such objections is found in the admiration and enthusiasm of excursionists spending a few hours in the country. The sense of freedom and the exhilaration from breathing a clean and invigorating atmosphere do not wholly account for the states of mind experienced. The sense of sight is more powerfully affected than any other, and the sight of growing things, throughout every period of development, is a most potent influence. Look where he will

he is confronted by color in endless profusion. It is often said that it is an expression of life. Plant life is always presented in color mediums, and green of some shade peculiar to the plant in its particular stage of growth is the predominant color. The subtle appeal to the senses could not perhaps be explained by ninety-nine per cent of the observers. It is enough that it exists, and that it is potent in influence, fascinating, and alluring its millions of observers to country scenes.

Surely we need no other argument to account for the awakened and gratified sense. The greens, yellows, and browns of the plants and flowers which form the basis of our industrial products should suggest their freer use in the planning and modelling of color schemes for advertising designs.

The dairy industry presents a large field for color-symbol expression. The various shades of plant green and of ripened grain and fodder which constitute the food of the cow provide an attractive group. The dairy products themselves, from the richly tinted milk of summer and fall, the more concentrated pigment in the cream, and the resulting butter make a combination of unusual value and beauty in expression.

To broaden the embodiment of business symbols through the color mediums which express them, a wide field is found in the oil, varnish, and paint industries. The colors of the flax plant from flowering to harvest time indicate a wealth of treatment in presenting the merits of linseed oil and its constituent varnish, paints, and inks.

The same principles of treatment will apply in the metal industries. Appropriateness of color should be remembered in all publicity schemes which are presented in ink other than black.

In mining projects the range of color may be wide and the designs can best illustrate the descriptive matter by a free use of the natural tints of ores.

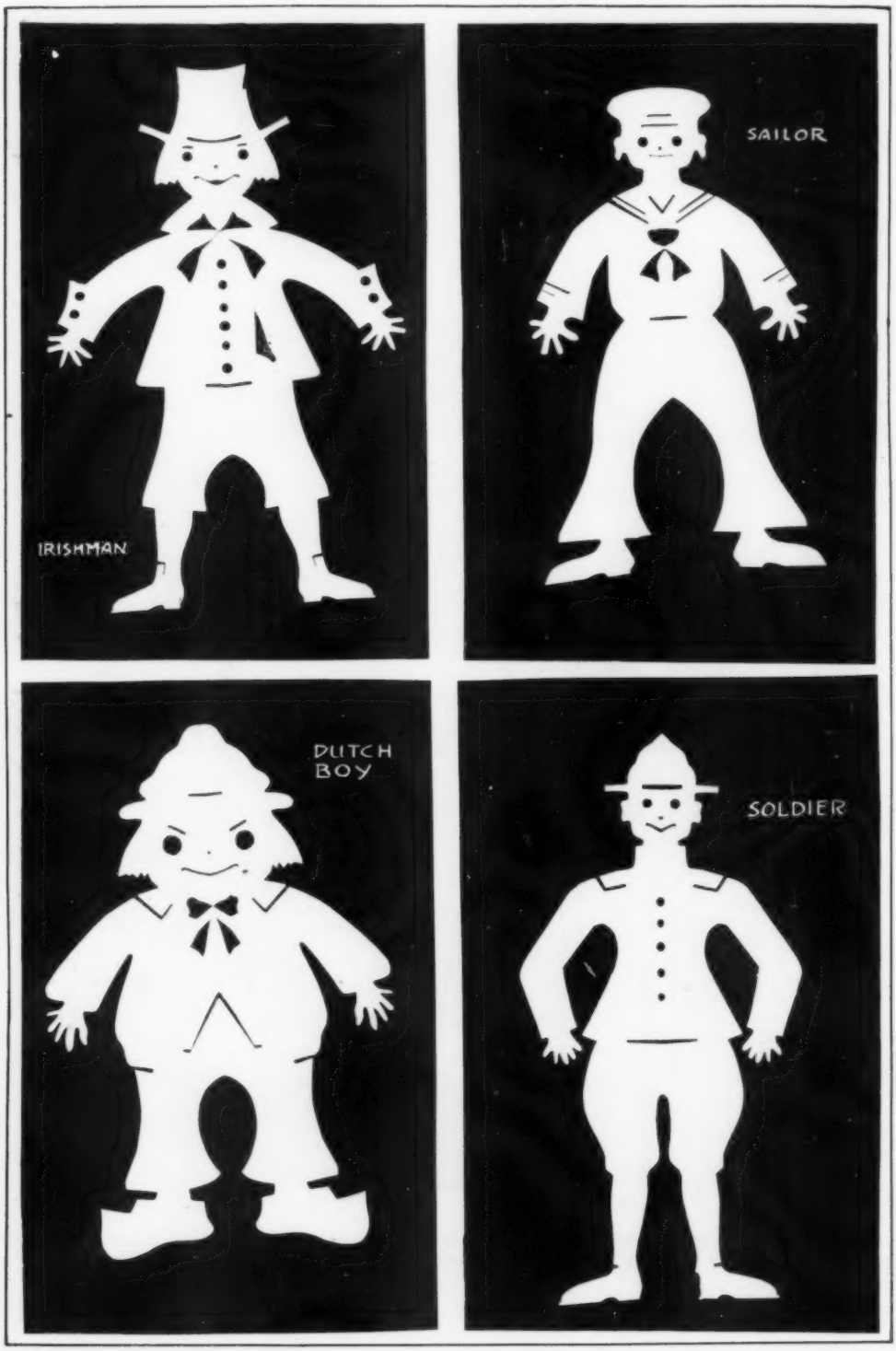
We may not be able to explain why a thing is incorrect, but defective technique does not prevent us from feeling discords. Advertising should be persuasive. To succeed it must win the eye, since almost all advertising matter is more potent when addressed to the eye than when an appeal is made through the ear.

Written matter is rarely ever fully acceptable if it does not make a good impression on the eye. Matter must be seen before it is read, and what is grateful to the eye is almost invariably sure to influence the mind.

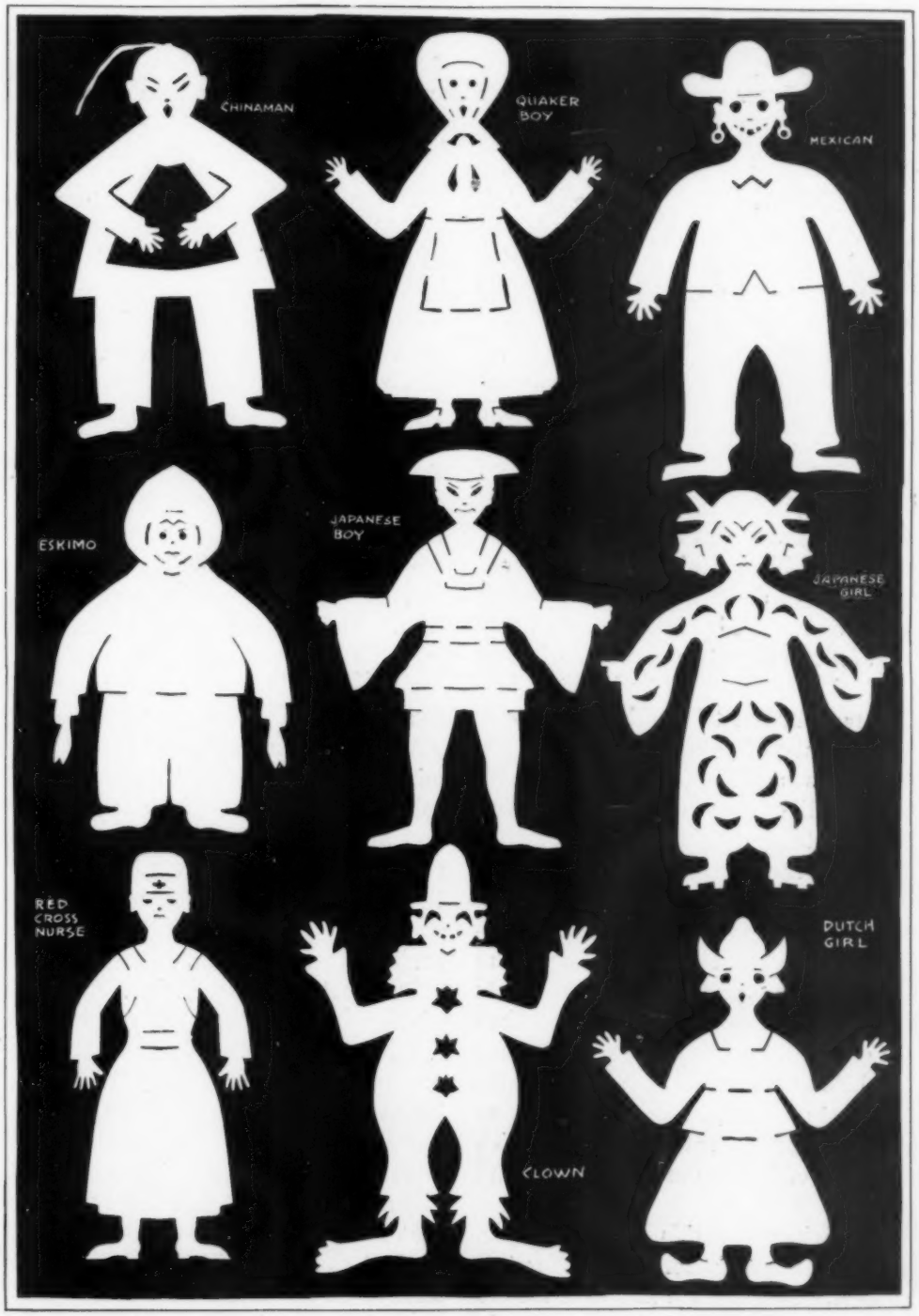
"Form is dependent entirely upon color; in other words, there is no form without color. Since the eye sees only color, and advertising must appeal to the sense of sight, it is one of the most essential, if not the most vital thing for the advertising man to know about."

—*Frank A. Parsons*

COLOR TO BE SUCCESSFUL MUST BE CONNECTED WITH PLEASING SPACE COMPOSITION OF LIGHT AND DARK. THE ABOVE DESIGNS GIVE AN EXCELLENT SUGGESTION FOR THE STUDY OF LANDSCAPE COMPOSITIONS



CLEVER CUT-UPS MADE BY FOLDED PAPER CUT WITH SCISSORS AND MOUNTED ON BLACK PAPER. FROM GRACE CHENEY OF WASHINGTON, VERMONT



CUT-OUT SILHOUETTES THAT CAN BE USED FOR A NUMBER OF THINGS. WHAT FUN TO OPEN THEM UP AND SEE WHAT THE SCISSORS HAVE PRODUCED. BY GRACE CHENEY, WASHINGTON, VERMONT.

Color Influence

The Influence that Color Exercises Upon the Eye and Mind

GUSTAV W. KLAU

WHEN this universe was created, it was endowed and surrounded by everchanging colors and hues, ranging from the most delicate to the most vivid shades.

The skies are a kaleidoscope of atmospheric colors changing from one color to another as the days wear on. What is more fascinating than to watch the break of day ushering in the most beautiful pale rose, pale yellow, violet and cold grays and all these vanishing into a rich blue at mid-day, and then at the close of day when we see the carmine, orange, and pale green tinted trail that follows the setting sun? And when we look around us we find that nature has not shirked to gladden our hearts with plenty of color. Everywhere we see trees and foliage ranging from delicate light greens to more subdued greens, studded here and there with a galaxy of varied colored flowers graduating from contrasting to harmonious shades. All these, as their seasons terminate, change to browns, reds and golden yellows, and when winter appears become lusterless and black. And then we are aware that the bleak gray days are before us, and when spring breaks amongst us again, we realize the coming of the beautiful transformation which will soon enlighten our eyes, hearts, and minds.

In giving you this little prologue, which I believe is very fitting for this subject, I am simply trying to convey to you the importance that color plays in the human mind and that nature has provided us with an abundance of it so as to enlighten our hearts and spirits. When nature endowed this universe with these wonderful colors it also provided us with the power to conceive and admire its color creations.

Scientists tell us that the eye contains three distinct color nerves. One of these nerves is very sensitive to yellow, one to red, and the other blue. When the eye looks upon red, then the nerve designated for that color becomes active and conveys to the mind what it has seen. The same method is repeated with the other two colors, or, to be more explicit, there is a nerve for each one of the primary colors.

When the eye sees two of these colors mixed, the result will be a secondary color. For instance, if we mix yellow and blue, we produce a green. When this occurs the two nerves that control the yellow and blue pick up these respective colors and transmit them to the brain and we see green.

Is it not reasonable, therefore, that whatever we produce to attract the eye should employ color whenever the opportunity presents itself? When an infant becomes peevish, or is in a crying mood, what is there that will quiet it more readily than a brightly colored picture or object? This simply proves that nature has provided us with that instinct at birth which developes more strongly as we mature and remains with us to the end.

The effect produced by color upon the mind and temperament is beyond comprehension. Every human being, whether savage or civilized, is attracted by color and governed more or less by its power. Color is just as essential to the evolution of mankind as sunshine, music, and literature. Sunshine enlightens our life, music sweetens it, literature broadens it, and color fascinates it.

It is also conceded that some colors act as a tonic upon the nerves, while others have a tendency to excite them. A large number of present-day publishers and advertisers have seen the possibilities of color, and are using it to a marked degree as attractive features. Study the magazines and printed matter of today and then reflect back fifteen or twenty years when they were devoid of all color. It merely proves that both publisher and advertiser have been convinced that color is the one great agent in attraction of the eye, and that it is a factor to be reckoned with in successful advertising and publishing.

In using colors, we are very often misled. For instance, if we should use a very bright green and red alone, the sensation when the eye is suddenly turned upon them will be of a vibrating or flickering one, but by adding a black, this sensation will disappear immediately. The reason is that red and green are extremely contrasting, and, to use the right expression, are fighting each other as to which is the more prominent. By applying black, we subdue this because the black being a somber color has a tendency to quiet down the two lively colors. I am using as an illustration red and green because they are more inclined to produce vibration to the sight when associated than any of the other colors, with the exception of red and blue, in which the vibration is not quite so marked. When two extremely contrasting colors are used, one should be used sparingly and the effect will not be marred by vibration, but will become pleasing to the eye. When several colors are to be used they should by all means be employed with discretion. The laws that govern them should be closely adhered to. For this reason I have defined them in classes as follows:

Luminous and Somber Colors

Colors are classed as warm or cold according as they are luminous or somber.

The luminous or warm colors are: Yellow, orange, red, and light green.

The somber or cold colors are: Blue, violet, and deep green.

When yellow predominates in green, we have warm green. When blue predominates the greens are cold. This is also true with every other color in which these two colors predominate.

The primary or simple colors are: Red, yellow, blue.

And those which result from their binary compounds are (secondaries) orange, green, violet, and their hues.

Color experts admit that the mixture of three primary colors in certain proportions produces black. Colors that are complementary to each other are classed as:

Complementary Colors

Red and green on white.

Yellow and violet on white.

Blue and orange on white.

Colors that are non-complementary to each other are classed as:

Non-Complementary Colors

Red and orange on white (very bad).

Red and yellow on white (are passable).

Red and violet on white (are passable).

Orange and yellow on white (bad).

Orange and green on white (not so bad).

Yellow and green on white (not so bad).

Yellow and blue on white (not so bad).

Green and blue on white (not so bad) if colors are deep.

Green and violet on white (not so bad) if colors are light.

Blue and violet on white (very bad).

Black never produces a bad effect when used with two luminous colors, but when luminous colors are used in conjunction with somber colors, black will not associate as well as it does with luminous colors only.

Luminous colors become more effective when printed on somber colored stock, and somber colors will show up to best advantage on stock of lighter shades.

When two colors are used in masses arranged so that one color forms a center, while the other is used as a surrounding color, we find that their shades change according to the colors used. For this reason it is always preferable that a dummy or sketch be first prepared for printed work, which is to appear in colors.

A printer may take special pains to mix the colors which he intends to use on a piece of matter as nearly exact as is possible, only to find that when he associates the colors they undergo a change due to the action that one color has on another.

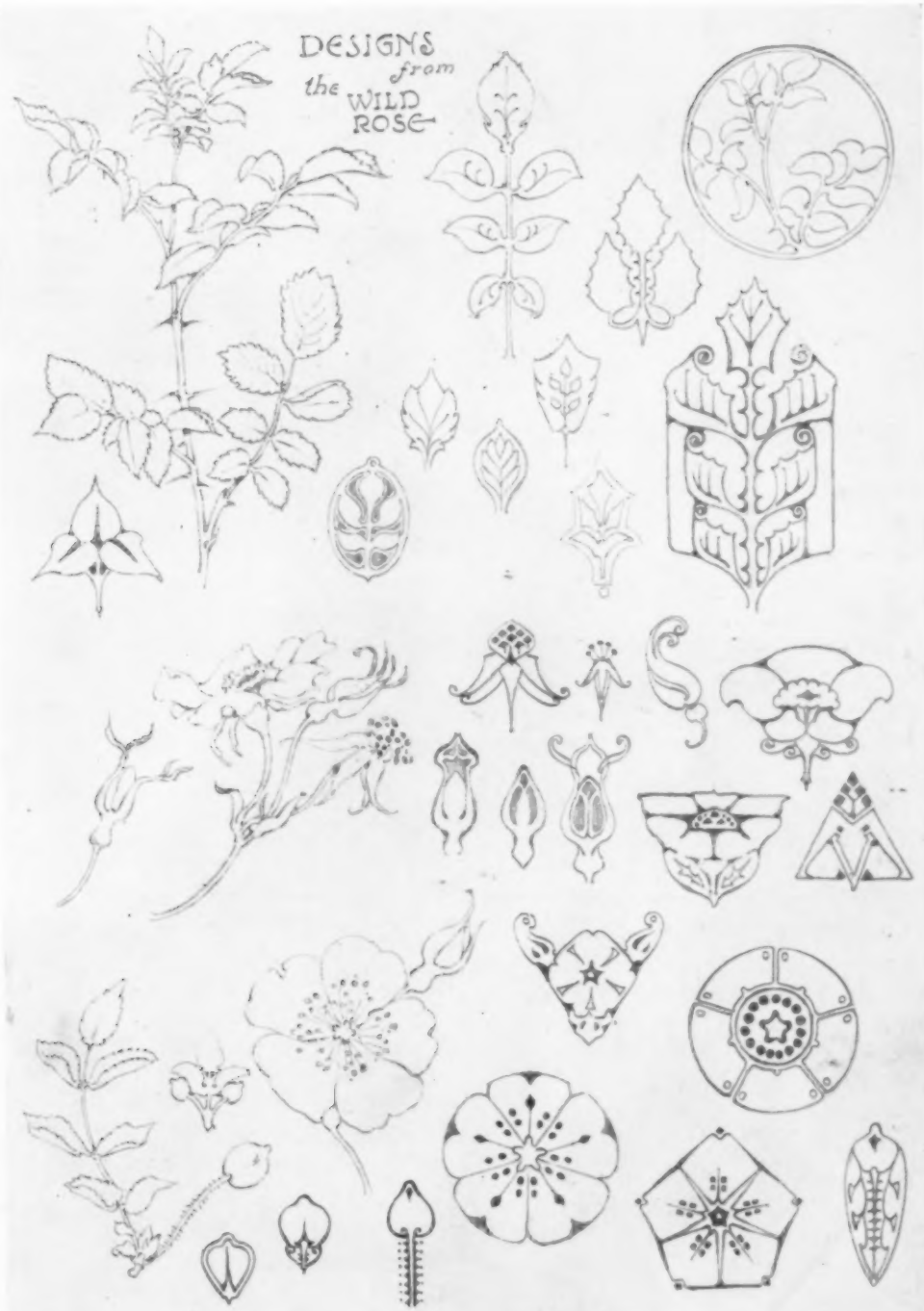
For instance, if a given quantity of red and orange is associated the orange changes from a reddish to a more yellowish shade while the red takes on a blue cast. When violet and red are thus used, the violet loses its redness and appears bluer while the yellow takes on a reddish cast. When violet and blue are thus used the orange appears redder and the yellow takes on a bluish cast. When green and yellow are thus used, the green appears bluer, and the red becomes yellowish. When orange and yellow are thus associated, the violet appears redder and the blue takes on a yellowish cast.

When red and yellow are thus associated, the red appears yellowish and the yellow takes on a bluish cast. Red and blue so used, produce a red inclining to orange and a blue to green. When yellow and blue are thus associated, the yellow inclines to orange and the blue to violet.

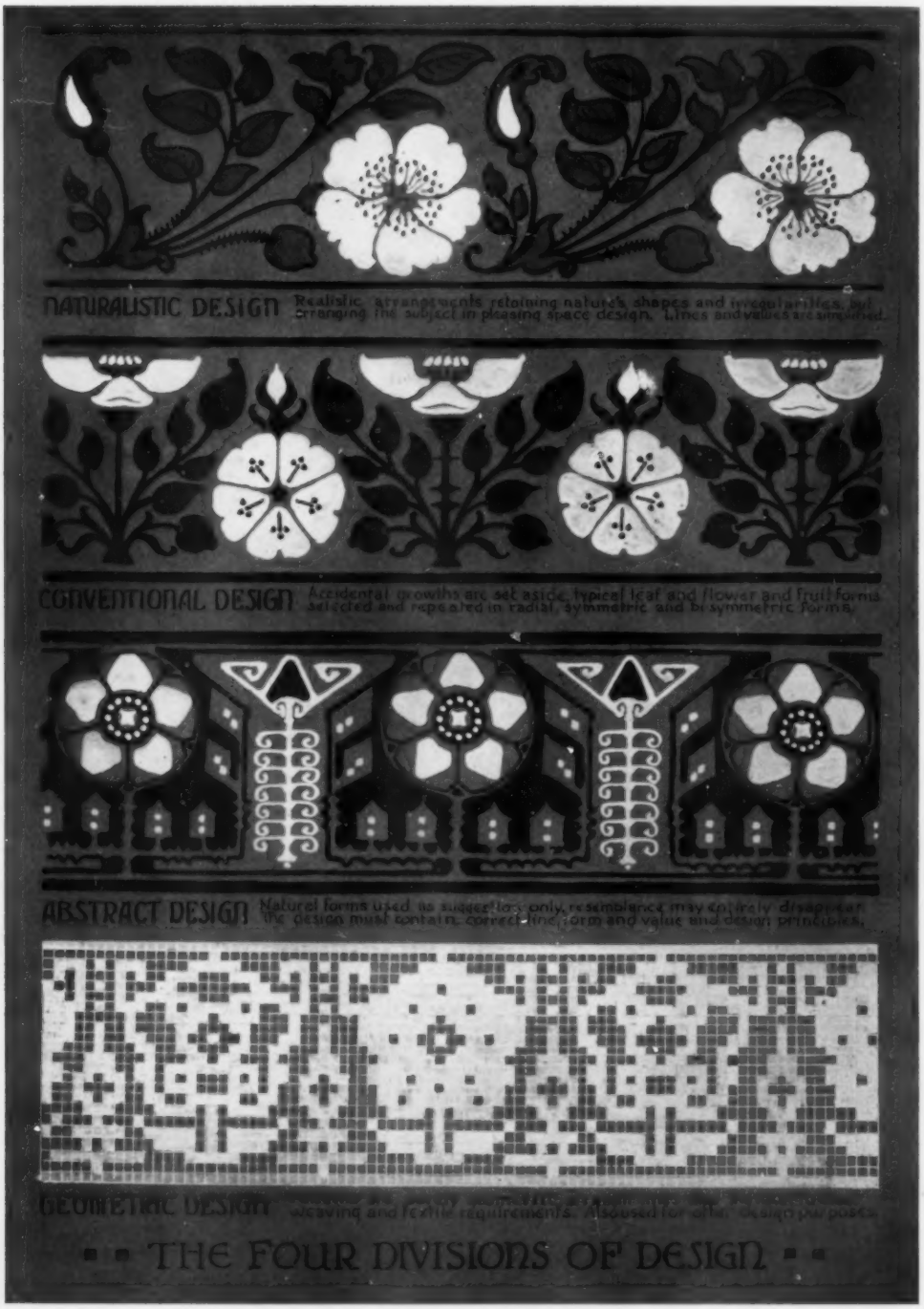
This color phenomena is due to the fact that by their reciprocal influence they lose more or less of the color which is common to both, and therefore differ from each other in proportion to this loss.

On account of these changing conditions, it is necessary that preliminary color proofs be pulled from the color blocks when colors are thus associated on a piece of printing. This will enable the printer to change the shades before making the edition run so as not to have the phenomena appear too marked.

A piece of printing produced in colors becomes attractive and in a sense dignified when the colors are used according to the laws which nature has created and surrounded us with. When we ignore these laws we produce something which is unnatural and repulsive to the eye. Therefore, it is well to remember when working with colors that we must follow nature or fail.



TO DESIGN WELL FROM FLOWERS IT IS NECESSARY TO ANALYZE THE SUBJECT WELL WITH A CAREFUL DRAWING. THE NEXT STEP IS TO DESIGN PARTS RATHER THAN THE WHOLE


NATURALISTIC DESIGN
Realistic arrangements retaining nature's shapes and irregularities, by arranging the subject in pleasing space design. Lines and values are simplified.
CONVENTIONAL DESIGN
Accidental growths are set aside, typical leaf and flower and fruit forms selected and repeated in radial, symmetric and bisymmetric forms.
ABSTRACT DESIGN
Natural forms used as suggestion only, resemblance may entirely disappear, the design must contain correct line, form and value and design principles.
GEOMETRIC DESIGN
weaving and textile requirements. Also used for other design purposes.
THE FOUR DIVISIONS OF DESIGN

THE BEGINNER IN DESIGN SHOULD DISCERN CLEARLY THE DIVISIONS IN DESIGN. UNITY REQUIRES THAT DIFFERENT TYPES OR CHARACTERS OF DESIGN SHOULD NOT BE MIXED IN ONE DESIGN

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The Wonder of Color

IF A RAY of light from the sun strikes the eye, it will appear to be white. If such a ray be passed through a prism, it will spread out into a band of six colors: violet, blue, green, yellow, orange, and red. If these colors be repassed through a double convex lens, they will be re-combined into a white light. Black is the absence of all color; it absorbs all color. White is a compound of two or more colors. Such spectral colors as, combined, make a gray, or shade of white, are called "complementary" colors. They are: violet with yellow-green, blue with yellow, green with purple, orange with green, and red with blue-green. In pigments which are not pure this may not apply. Blue and yellow make green. This point is of importance in its application by color-blind artists.

The retinal nerves—the rods and cones, and the brain cells in the visual center—are able to distinguish all color shades by the character of their vibrations, just as the ear knows the sound of a horn from that of a violin by the quality of the tone produced. In this respect the retina and the brain center of sight are smarter than the brain as a whole; the less is greater than the whole; the secretary is a better accountant than his employer. The master brain is at the mercy of its sight secretaries. In the retina, in its relations to sense of color, lie some of the most remarkable, puzzling, fascinating, beautiful, and unsolved phenomena ever studied.

The most satisfactory and plausible theory of color vision is that the rods and cones are the special nerve fibrils which interpret the vibrations of light and color; that the rods (needles) interpret light in its purely luminous phase (the quantity of white without regard to color); that the cones (pins) interpret colors, and distinguish them by the length of their respective waves; and that the many shades which are the product of mixed colors are likewise recognized by the lengthening or shortening of the wave-lengths. There is a definite length to the vibration waves of the six primaries of the spectrum. Red, the longest, is 1/36,000 of an inch in length; and violet, the shortest, 1/61,000 of an inch. If a note is sounded on a violin held near an open piano, it will cause the string in the piano which has the same number of vibrations per second—has the same pitch—to sound the same note. So may there be retinal cones which respond to each color wave's individual vibration. When the eye gazes upon pure red, 481,000,000,000 waves will beat upon the retinal shores in a second. Change the color to violet, and 764,000,000,000 waves will rush through the open window of the eye. Wonderful vibrations, wonderful mathematics! Between these two extremes, representing 283,000,000,000 different rates of speed, lie all the colors of the rainbow, and by those vibrations must the eye detect each shade. There are 4,000 waves per second in the vibrations of the highest string on a piano, and each wave is three and one-third inches long;

whereas there are 61,000 violet waves in one inch. We can "think" of slow sound waves, but the brain gets overheated trying to follow the waves of light.

What remarkable sensitiveness the retinal nerves must possess, and yet silver and platinum "nerves" are far more sensitive. The eye can see only twenty-odd per cent of the color waves that fly through space. We are all totally color blind to the remainder. All waves that are longer than 36,000 to the inch (red), or shorter than 61,000 to the inch (violet), are invisible. As shown in Figure I there are waves longer than the red, called infra-red, unknown, and electric; and waves shorter than the violet, called ultra-violet, and Roentgen rays, which may be defined in musical analogy as covering three octaves, leaving about seven-eighths of an octave for the six colors which we can see. Our eyes are to the color scale of nature as the child with its toy piano is to the master musician with a concert grand. Through the fluoroscope, which retards the speed, the eye can see some of the ultra-violet rays; and the infra-red rays can be felt as heat.

There are two kinds of light waves emitted from all objects; color and white waves. Whenever a source of light, as the sun, strikes an object, part of that light is absorbed and part reflected—thrown back. The latter represents such object's "luminosity." The color-blind are never blind to this form of light. A mirror reflects almost all the light that falls upon it. Polished silver reflects ninety-two per cent of perpendicular rays. Broken surfaces split up such light, and so appear dark. The more luminous an object, the more intense is its effect upon the retina, just as two horns affect the ear more keenly than one. The more intense or stimulating a light, the quicker is the retina exhausted. It becomes temporarily paralyzed in the cones of such a color. Look at the sun, then look away, and you will still see the sun; but its color appears a pale blue, which is the farthest contrast to the yellow-orange of the sun. It is the complementary color. The light of the sun is so intense that it quickly exhausts the yellow-orange cones, leaving those farthest from it (blue, the "complementary" of yellow) least exhausted; hence this after-image of the sun looks blue (actually a pale greenish blue). "After-images" and purely subjective sensations of light and color often fool the judgment center of the mind that relies too implicitly upon its "visual center"; which partly accounts for many marvelous tales in human experiences.

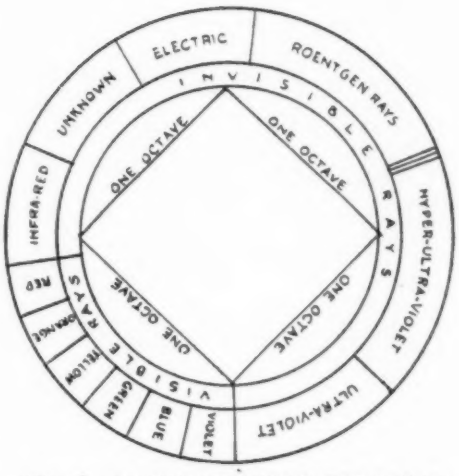


FIG. I.—DIAGRAM SHOWING THE PROPORTION OF VISIBLE TO INVISIBLE COLORS

The eye can see less than one-fourth of all.

A STANFORD ARCH. A PASTELLO PAINTING MADE DIRECTLY FROM A NIGHT SCENE, IN TWO WORKINGS. COURTESY OF THE AMERICAN CRAYON COMPANY, SANDUSKY, OHIO, AND WALTHAM, MASSACHUSETTS.

Night Sketching with Color

PEDRO J. LEMOS
Stanford University, California

THE easiest way to acquire the ability to sketch night scenes, twilights, the enchantment of moonlight and all the beautiful nocturnes that night presents to the nature loving soul, is to begin. A beginning is surely half the journey in sketching from night scenes. You have admired the gleaming night pictures and deep gloaming scenes at the exhibitions and you have said, "Some time when I have more time I shall do pictures like that." Now, of course, the time to sketch night scenes is after the day's work is done, when the tired worker seeks slumber's rest, or the attraction of an evening program. As a variation, however, try an evening or two of wandering with pad and colors in the field or down the road, along the lighted street or in the building doorway; and catch the great lights of night and the beauty of the shadows. The view that may be ugly by day, and the space cluttered with detail by light, become attractive compositions by night. When evening's veil drops over the country or city, it simplifies masses and reduces the varying forms to large, easily comprehended shapes; striking in pattern, boldly silhouetted against half-tones of pearl and violet grays; with here and there the staccato notes of bright lights or mellow glows.

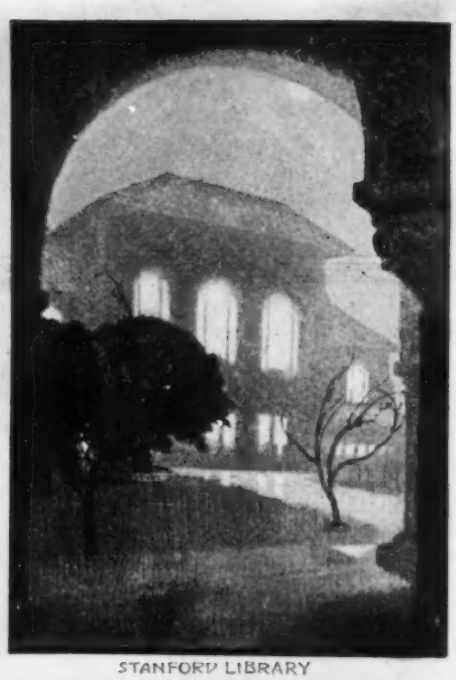
The scene that you never thought of by day is the one to which you will return to sketch again and again by night. The sketch you complete at night will often appear discouraging, but by day with a touch here and there it will grow upon you and with each new striving, more and more of night's qualities will enter your work.

The usual student has been trained with the idea that sketching with colors at night is an impossible feat. True it is that the colors with yellow and reds are deceptive by night light, but a method to overcome this defect is as follows:

Secure a box of Pastello Crayons (Box No. 1044 or Box No. 1043 made by the American Crayon Company) and several sheets of gray or dark blue, rough cover papers. The crayons come twenty to twenty-four definite colors in a box. These colors will become permanently fixed in your mind after using them for some time. Cover paper for working on can be secured at a printer's paper supply house or from the school supply companies. The paper need not be heavy but should not have a smooth, hard surface but rather a slightly rough surface, generally known as "antique finish." Linen finish papers are also good for the work if the finish is soft and not hard in quality. A Wolff or Conte crayon pencil of soft quality should be used for sharp details or outlining. The paper used may be made into pads or a light building board or cardboard may be used for resting the paper upon. A flashlight may prove a good addition, lighting up the sketch occasionally if the view requires working in a shadow.

With such equipment you are ready

STANFORF QUADRANGLE



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AN OLD SPANISH ADOBE

THE TONE OF PAPER UPON WHICH THE NIGHT SCENE IS TO BE SKETCHED SHOULD BE IN VALUE NEAREST TO THE SKY COLOR

for the night's jaunt and you go out to capture the illusive, mystic hues and lights. At almost every turn you find subjects—or maybe you don't. If you don't, it is not because they are not there but because you are of the uninitiated and don't see them. To become initiated, I give the following prescription and rite that you may see hidden pictures: Purchase a "reducing glass," a glass in general shape like a magnifying, reading glass, excepting that the lens is concave instead of convex, reducing instead of enlarging. This glass is round in shape, but you should paste strips of black paper on it so as to leave a rectangle equal in shape to your pad or paper upon which you are working. This is easily carried in the pocket or hand and by holding it up occasionally it composes or includes within its space parts of the view in front of it. You can move it until the subject is viewed to the best advantage and of course you then sketch in it this relation onto your pad. This reducer also obscures detail and with such a helper it will not be long before you can discard it and become your own composer.

Having found your subject, you decide which of your papers come closest in general color to the coloring of that night—for every night coloring is not the same any more than is every day. You have gray paper and green blue paper and a deep blue paper. You decide that the deep blue paper will serve the general background quality tonight. There is a violet quality through the sky that the blue paper does not have, but selecting the violet color from the box you rub it over the sky portion lightly and with a few rubbings of the thumb you produce the right sky color. The bold tree and the cabin (and who ever would think of it as a subject by glaring daylight) are of a most interesting deep blue black mass with warm browns here and there, silhouetted against the violet blue hill that melts into the sky. The black crayon is rubbed over the entire silhouette shape in sweeping strokes. The blue crayon is worked into the black masses and the brown and orange crayon are worked into the warmer parts here and there. The gray road is touched in with the right crayon, and the picture with the exception of the lights is about completed. The sharp glow of light in the window and on the road is touched in. It is too abrupt. The fingertip touched to it gives it the right blur. The light yellow crayon again touches the center portion of the glow and there—the light fairly shines from the pad. You look at the view and memorize the colors. Wonderfully subtle! Can you remember them? Memorizing color is a splendid eye practice. If a hundred per cent more memory drawing of form and color was part of our school art departments' work, what strides we would soon be making! Anyway, you have decided what each mass of color is and the next day with a half hour's work you true up your night's sketch. It may not need any truing at all, but you may often do the easily remembered, smaller parts after you have returned. If you are inclined to see too much in a scene, it may be well to practice sketching in only the bigger parts, and then I would advise you to cultivate a poor memory for details so that you will be unable to put them in when finishing the sketch at home.

CAMPUS TWILIGHT

SENIOR WOMENS HOUSE

WHEELER HALL

THE GREEK THEATRE

NIGHT PICTURES MADE AT THE UNIVERSITY OF CALIFORNIA. THE DARKER MASSES ARE SILHOUETTED IN THEIR RESPECTIVE COLORS AND VALUES AGAINST THE BACKGROUND AND THE HIGHLIGHTS ADDED LAST

You cannot be located anywhere on God's earth where night does not present inspiring nocturnes. The city outline or the village corner, the flat meadow or the barren stretch is enriched by the sky and its myriad lights. Any location by night is a subject that will prove an enthralling hour's, yes several hours', work and enjoyment.

Once you commence sketching at night—and the crayons and paper are the simplest of equipment and the most responsive—you will go again and again. The watchman on his beat will come, accustomed to your prowlings for art's sake, and chat, asking: "How's the sketch tonight?" And the hurrying seekers of pleasure will hasten on with possibly a glance of curiosity, never knowing that you have found a pleasure far surpassing the eye-straining movies, the aboriginal dance, or the balancing of ice cream and cakes with platitudes that you do not mean at all.

Ink-Pastello Painting

A. H. PORTER
Chicago, Illinois

IN the March number of the SCHOOL ARTS MAGAZINE appeared a most helpful contribution to the teachers of drawing, entitled "Pastello Painting." The explanation for the use of water in connection with the pastello is so explicit that the writer will not have to repeat or further elucidate.

I have been using this medium for about ten years and did not know that others have been employing this method of expression in drawing. Possibly, someone has gone a step further and can give us something still in advance of Mr. Lemos' work. I have been going somewhat farther. After using a wide, ten-cent brush to apply the warm water, I take the five-cent Chinese brush and apply a graded wash of fluid ink, such as is generally used in a fountain pen. I begin at the top and dip into ink first, and later dip into water and overlap, holding the paper (6 x 9), attached to a small 10 x 12 drawing board, at a slant, so that the fluid gradually flows downward and thus blends—to give a neutral gray sky and water desired in the picture. Before the surface is dry, I work the pastello, using from the twenty-four color box. I use the two olives, the light green, the light brown, the cerulean blue, the cream for any high lights and the black for shadows. If any sunset effects are sought, warm colors are added near the sky line—such colors as orange, pink, and Indian red. The white can be used with pleasing effects in far-away water surfaces or to indicate the sail of a boat in the distance.

Sometimes, the middle distance of the picture can be made interesting by using very sparingly the inked, sharp-pointed, Chinese brush and allowing the same to spread each way, making shadows and lending charm to the scene because of far-away effects, also giving depth and better perspective.

It certainly would be interesting to

know what others are doing in this regard. High priced materials and the time it takes to use them have prompted me to employ these substitutes, but I have found them to give most encouraging results.

When pastello is applied to dry Springfield white paper, I go over the surface or picture space with the side of a piece of the Waltham, celebrated, white chalk crayon; stroking it into the pores of the paper in one direction only, then rubbing it in with the tip of a finger, stroking toward me only. When this surface appears like a piece of white marble, I apply the dry pastello, beginning in the upper right corner of picture space and using the heavy, darker colors at first. Gradually, toward the sky line, the lighter, warmer colors are employed. These colors can be smoothed and blended by the finger tips, stroking toward the left. The application of the white softens all the crudities and harsh colors that may appear. In the foreground and middle distance, the pastellos will give the proper effects without using the fingers.

For a fixative, denatured alcohol with a little white fluid shellac is sprayed on with a jointed, L-shaped, fifteen-cent sprayer. The sprayer is furnished by the Milton Bradley Company.

COLOR

We must remember that while Color is a child of Light, yet, to the colorist it differs greatly in sentiment and character from its parent! However refined and luminous may be a white marble statue or temple, its sentiment isof another order than that of a glowing twilight or superb rainbow. The angelic purity and elegance of an Easter lily can never supplant, in human affection, the tenderness and passion of a melting rose. Form is more intellectual, but Color more emotional. The first appeals to the Mind, the second to the Heart. Form is masculine, Color feminine.

John Ward Stimpson

Symbolism of Color in the Festival

MISS HAZEL WILLIS
Art Department, South Dakota State College of Agriculture and Mechanic Arts, Brookings, South Dakota

SINCE the pageant has come to play such an important part in our public life, we are naturally becoming more interested in settings and costumes and the color necessary to their successful and harmonious presentation. One may consider these from the scientific color theory point of view or go one step farther and build the costume or scene so that the color effect will give the audience an idea of the character of the scene or person presented.

I do not offer the following notes as an authority on the subject but merely as impressions which I have received and ideas that my friends have given me.

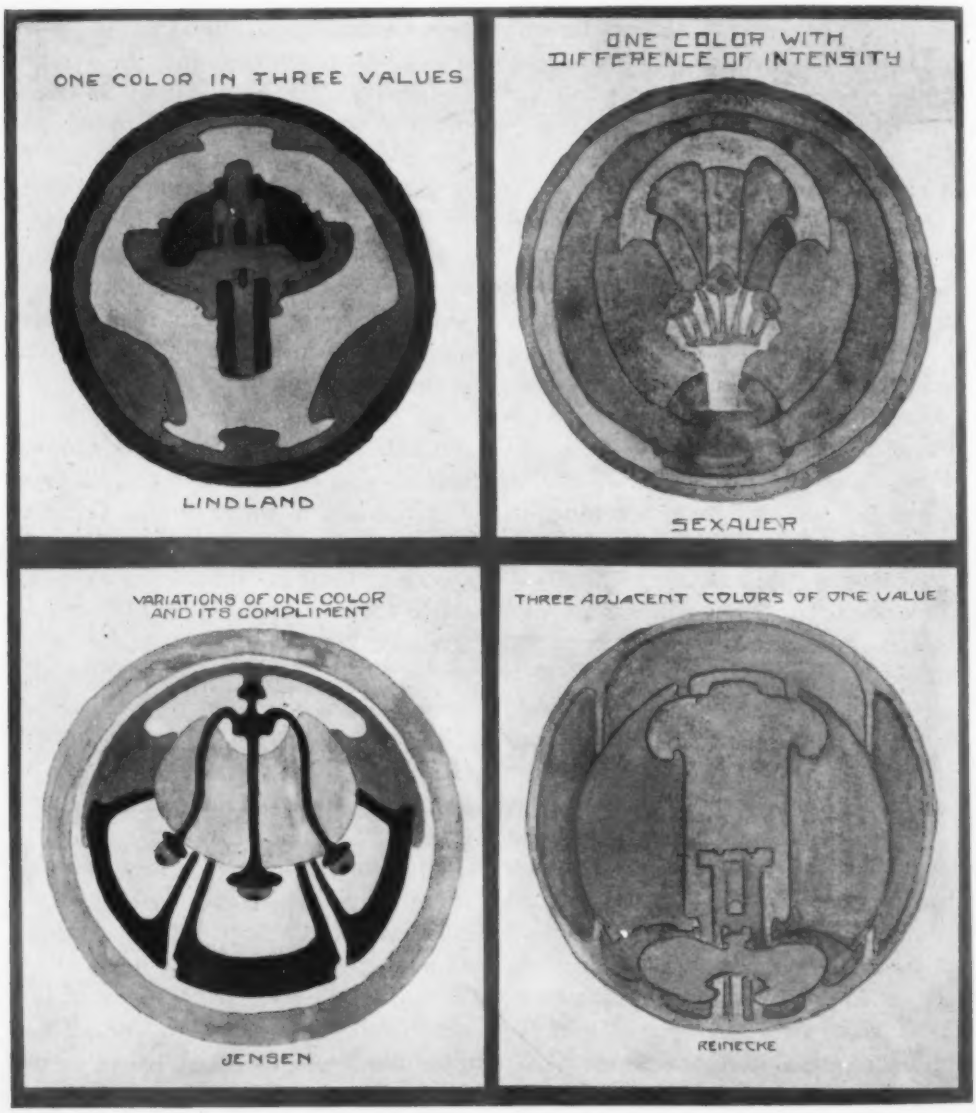
Symbolism of color may be considered from three points of view—that of season representation, that of the special festival and that of symbolism in general. The first is the simplest. For example, take a spring festival. The colors for decoration or for costumes may be taken literally from the flowers to be represented. There is yellow from the daffodils, dandelions, and buttercups; pink from the fruit blossoms; lavender from anemones; and deeper blue purple from the violets. There are a number of wild flowers that might be used, but perhaps the color that means growth and that is almost synonymous with spring shoots and buds is pale green, and this color might be used to predominate while the other flower colors were so chosen as to make the most agreeable color scheme.

Harvest festivals are often given and, for these, colors of autumn leaves, fruits, and vegetables may be used. The true color of the things signified may be changed slightly, however, to make better harmony with the whole.

Then there are the winter festivals of Christmas and New Year. In some parts of the country, white would predominate to represent snow, while in others red and green would represent red berries and leaves. I do not think I need go into further detail about this type since we are all familiar with these seasonal colors and can easily select colors representatives of the different parts of the year.

In taking up color for the special festival, I have chosen two kinds for examples—the patriotic and the religious. For patriotism we generally think of red, white, and blue. These colors in our flag stand for definite ideas. The red is for love—love of country and all that our flag stands for; white is for purity; and blue is for truth and loyalty to our country, its aims and ideals. These may be used for the costumes of characters representing these ideas, for groups of people or as general decoration.

In trying to find color most suitable for a religious pageant, I decided the colors used in the service of the Catholic church were richest in symbolism. White, which stands for purity of life, glory, and joy, is used for vestments or altar clothing at special feasts of our Lord. Feasts of the Holy Trinity, of



THE DRILL OF HUE, VALUE AND INTENSITY CREATES AN EYE THAT DISCERNS COLOR VARIATIONS RAPIDLY. EVERY STUDENT SHOULD BE FAMILIAR WITH THESE COLOR DIVISIONS

the Blessed Virgin and feasts of angels and saints who were not martyrs, also employ white. It is used, too, in the consecration of churches or bishops and at the ordination of priests. Red, the color of fire and blood, symbolizes martyrdom and is used at Pentecost and feasts of the Apostles and martyrs. Green means hope and eternal life and is used from Pentecost to Advent, which means preparation for the coming of our Lord. Violet is a sign of humility and penance and we find it during fast days, during Lent and on vigils. Black, signifying mourning and sorrow, is employed for masses of the dead and on Good Friday. Brown, the color worn by certain orders of monks and nuns, is for renunciation and self-sacrifice.

Now to take up color in general, we will see what the popular meanings of color are. Although at first some of the ideas seem to vary, I think you will agree that they are somewhat related. Red is a barbaric color in a sense; it was symbolic of fire and war and is recognized by man and beast as a sign of danger. It is an exciting color and rouses to action, and then again it may mean passion or courage or love. Mr. Van Dyke in his criticism of the pictures of the Holy Grail by Abbey, and in which Galahad is clothed in red, says, "Red is the hue of life and love and sacrifice, red is the human color."

Blue, on the contrary, is a soothing color, is retreating and is sometimes used in the treatment of nervous disorders. Sometimes it means faith or sanctity, sometimes mystery or remoteness.

Yellow is significant of gayety and cheer and makes one think of joy and sunshine. Green comes fresh from nature and expresses life, growth, and expansion. White, though not a color, has always stood for purity, innocence, and sweetness. The strength of red combined with the dignity of blue gives us purple, a color always connected with royalty. Then, if we combine the joy of yellow, and the courage of red, we get a force or power in orange. Black is always indicative of sobriety or somberness.

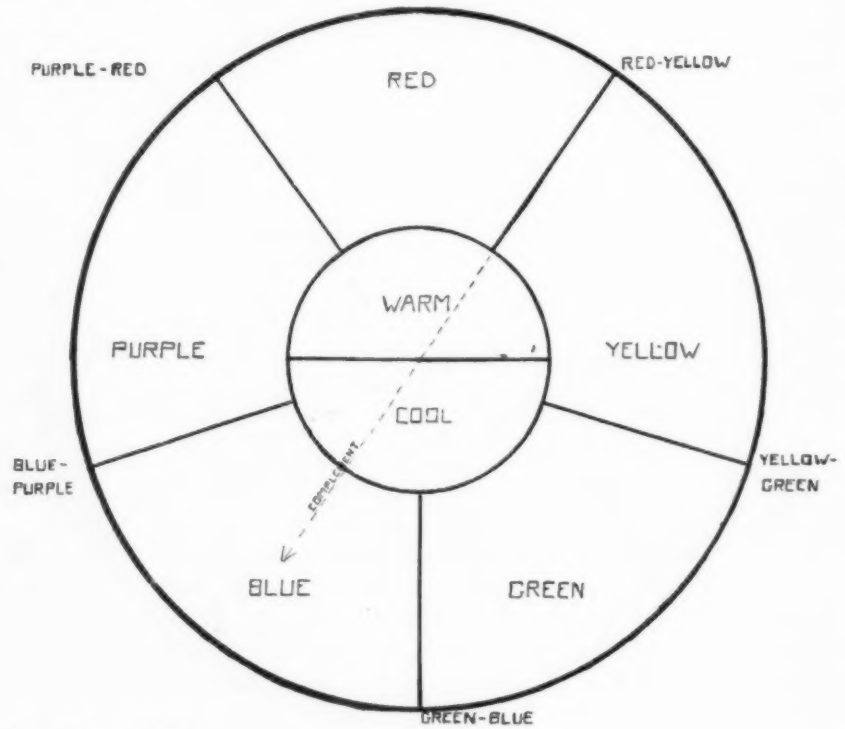
Perhaps if we consider these colors used in relation to people in books, on the stage or in life, we can see better how much they mean and how they affect us.

There is always something very attractive that makes us love a young girl dressed in pale blue. Now just what does her garment mean? It is purity combined with that faith which makes us feel that she is almost spiritual, and if a fellow with a flaming red carnation in his buttonhole came into her garden, I'm sure you would want to be there to protect her. However, if we change the picture and find a youth with a white flower in a café with a woman dressed in red inclined toward orange, you would not fear for her but rather wish the boy wouldn't go where he would get his fingers burnt.

Perhaps you have read "Lavender and Old Lace," by Myrtle Reed. Doesn't the color, lavender, a color of blue and white, suggest a remote love affair to which our lady is remaining true? Then in "Old Rose and Silver" I think "Old Rose" just suits her. It is red for a great love touched with loyalty, blue, and all under a quiet gray reserve. The other girl—I do not recall her name but always think of her as "Silver Girl"—is represented by a

COLOR THEORY

COLOR WHEEL



DEFINITIONS

HUE = COLOR R, Y, O, G, B, P.

VALUE = THE DARKNESS OR LIGHTNESS OF A COLOR.

INTENSITY = { BRILLIANCY OR STRENGTH
DULLNESS OR GRAYNESS

COMPLEMENTS = OPPOSITES ON THE COLOR WHEEL

COLOR HARMONIES

1. ADJACENT USED STRONG, PURE, INTENSE.
2. COMPLEMENTARY USED IN SUBORDINATION.
3. PURE HUES COMBINED WITH BLACK, GRAY, OR WHITE.
4. ANY HUES MIXED WITH BLACK OR GRAY.
5. ANY HUES MIXED WITH A COMMON COLOR.

cold color with a superficial glitter; and the turquoise ring—a symbol of faith and loyalty—that was offered her she throws away because she is not deep enough to understand. It is the color in Myrtle Reed's books that stays with me. I always see her characters through their color.

I recall the play, "Prunella," as a design splendid for its symbolic color. We see her first as a young and innocent child dressed in pale green and white, while Pierrot comes to play with her dressed entirely in white which gives us confidence in his goodness. The next time we see them, she is the personification of pure, childlike faith in a white gown and deep blue cape. Pierrot has acquired a black cape which is very significant even to its checkered lining of black and white. He takes the blue cloak from around her and envelops her in his own of black; when he unwraps her she steps forth all in white and he carries her away in her innocence. At the last she returns in dark gray, blue and purple. She has suffered much but still has faith and deep in her heart she loves him. Pierrot comes in entirely weary of the world and what he has gotten out of life, and he is clothed this time in somber black.

So we may take almost any well-thought-out play and see just why the characters have chosen their particular colors and how much it unconsciously affects the audience; and, for that reason, color is one of the biggest elements in any festival or pageant.

OUTLINE OF LESSONS IN COLOR

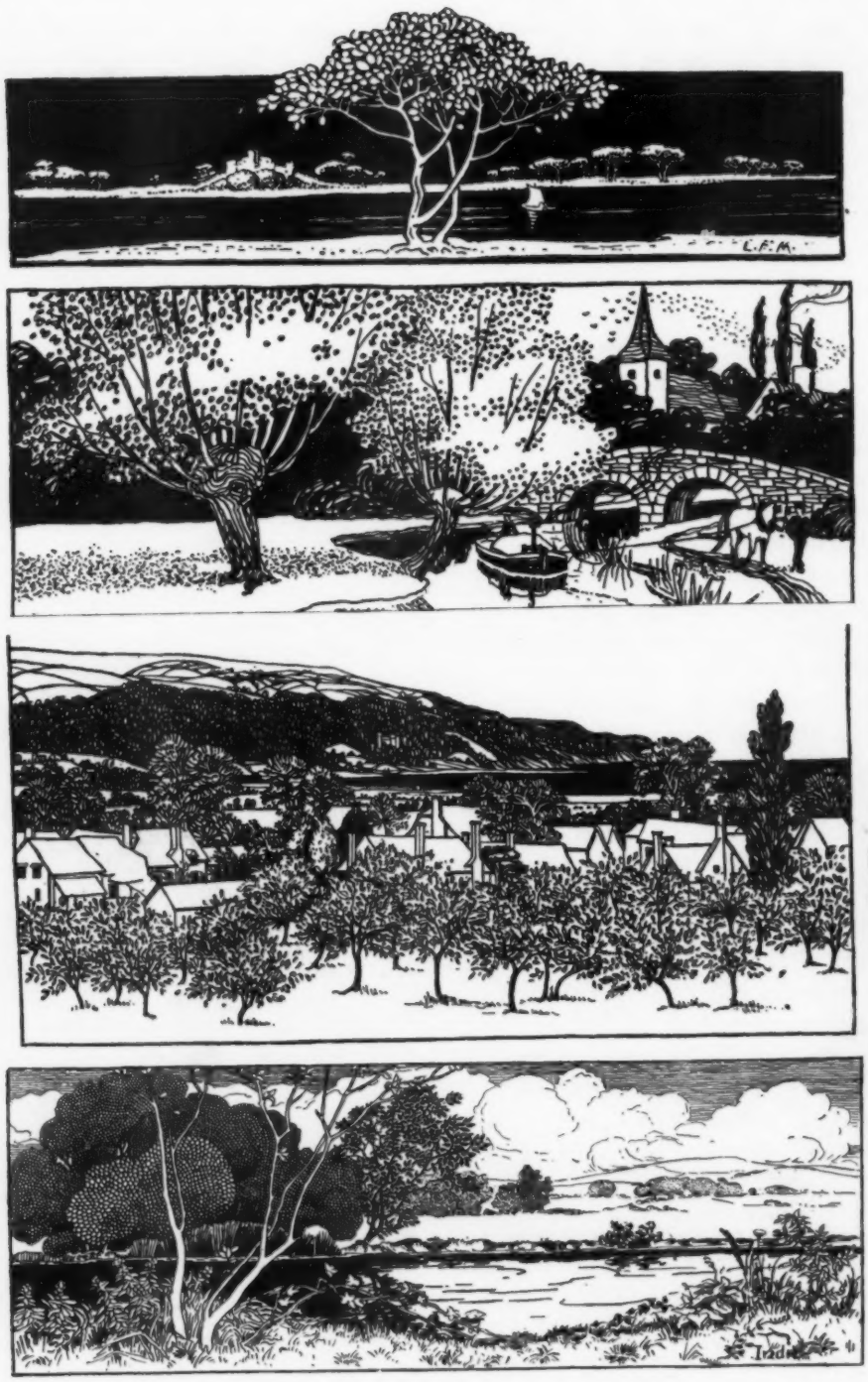
1. *Create line design* to be used as vehicle to define color and qualities of color by painting. Circle—five inches.
2. *Give arrangement of color wheel* and define color terms. Hue. Value. Intensity. Complement. Warm. Cool.
3. *Value*, using design of lesson 1. Paint in three or four values of one color.
4. *Hue*, using same line pattern. Paint in three neighboring colors in one value.
5. *Intensity*, using line design. Paint in *one* color, *one* value using difference of intensity.
6. *Complements*. Find complements on color wheel, and in line design. Paint one color using difference in variations of value and intensity and the complement in subordinate relation in full intensity.
7. *Review of work*, naming and describing given colors for hue, value, intensity, warm, cool, complement. Suggest color harmonies and give five simple laws.
8. *Make a design* (about ten inches) in charcoal to be used in experimenting in color harmonies.
9. *Trace design* of lesson 8. Make harmony using adjacent colors in pure, strong, intensity.
10. *Make a harmony* using complementary colors used in subordinate relation.
11. *Produce a color harmony* using pure hues *combined* (not mixed) with black, gray or white.
12. *Use any hues mixed* with black or gray to make a color harmony.
13. *Use any hues mixed* with a common color.
14. Study on choice of a combination of the five laws to produce a color harmony.

NOTE. Lessons 3-6 are done in transparent water color since it is easier for beginners to mix that kind of color and there is less change in value and intensity in the drying.

Lessons 9-14 are done in opaque color—by mixing opaque white with ordinary water colors.

TO REACH ITS HIGHEST USE, ART MUST BE PRACTICAL. UNLESS WE CAN APPLY OUR KNOWLEDGE OF COLOR TO THE COMMON ACTIVITIES OF LIFE, WE MISS THE LARGEST BENEFIT AND THE GREATEST JOY THAT SUCH KNOWLEDGE CAN GIVE.

—*Bonnie E. Snow*



DECORATIVE LINE DRAWINGS FROM LANDSCAPE. A SUGGESTIVE PROBLEM FOR VACATION DAYS

XMAS DESIGNS

from the portfolio, "Applied Art," published by F. K. Ferenz, New York City, containing fifty plates, mostly in color.

BOOK-PLATES IN COLOR

From the portfolio, "Applied Art," Volume I, published by F. K. Ferenz, New York City, which contains several hundred designs on various phases of Applied Art, beautifully arranged and printed.

Color and Costume

GERTRUDE COPP
Trade School for Girls, Milwaukee, Wis.

COLOR is one of the means by which monotony is relieved both in music and art and is conveyed by waves of specific strength to the ear and eye. How harsh and tiresome the playing and singing of the person who gives each note the same degree of strength; how unattractive the food that is served if it is not embellished and how stupid the gown with no change in color. For this reason we are striving to find for each individual the suitable colors to make him attractive in the eyes of noble and wise persons. In every walk of life we must be alive to the meaning of color and to know why we like or dislike its use. The untrained girl that comes to us usually has startling ideas as to what suits her type of beauty but soon sees that something is wrong and by the time she graduates a very marked improvement is shown. As she comes in contact with the outside world she blooms into a fair example of our efforts. We cannot delve too deeply technically, but simply awaken in her mind the love of harmonies, calling attention to every day beauties for a keener enjoyment as well as practical use.

Nature is a great storehouse and sets standards and combinations, never going astray in her fish, buds, butterflies, berries, leaves, stones, shells, etc., in an endless variety. As one sits by the open fire, watching the snapping, charred log, there dawns upon his imagination a color scheme that might be used for a costume—the gray of the ashes for the dominant tone with the colors of pink, blue or green of the flame for a singing note with the splendid black of the burnt log for character. Another example is found in the seasons, representing the changes of life—spring with its varied green mantle, emblematic of youth in its freshness; and summer with its brilliant coloring of the flowers and fields, early manhood and womanhood; autumn with its ripe and more sombre hues symbolizes mature life; while winter with its grays, purples, and blacks and occasional bright spots, together with the glowing colors of the sunset of life, are modified to the dying day.

Behold the dignity in the unfolding of nature's charms! As the years creep on nature tenderly and gracefully changes the tones and why should women rebel? In the animal and bird kingdoms the male is many-hued to attract his mate while quite the reverse is true in the human family. Men in the early periods wore gay colors as well as women but as the former became involved in modern business, lace and ruffles were discarded and the colors were changed to more sombre tones (perhaps one reason for more color-blindness among men than women.)

Why may we not determine character by the choice of color? Is not the Quaker, of the calm and peaceful nature, clad in gray and black while his brother of Spain bedecks himself in red and yellow betokening the love, jealousy and passion of his race? One must see that he has a color of his own as he considers his skin, eyes, and hair. The colorist, in whatever field of art, must

have an illumined mind, possessed of refinement and a nature sensitively attuned, or color theories are of no avail. Artists and dyers are busy developing a wonderful riot of beautiful tones to please and tempt, for most tempting they are.

Bright or pure colors suit the young and clear complexion but may be employed as singing or climactic notes to relieve monotony of the dress of the more mature. If the complexion is too ruddy, then the colors may be more neutral in order to bleach it. In our color work we have the scale of nine from black to white with the relation of the spectrum colors to each note. Each color is then raised to white for tints and lowered to blacks for shades; then as the color approaches the scale of black the neutral tones can be found. One or more tones of a scale may be used with its contracting note but if neutralized must be neutralized to the same extent as the keynote with a fuller intensity for brightness. The contrasting or complementary color may be found by placing the spectrum colors in order about a larger circle as Y, YYO, YO, O, OOR, OR, ROR, RRV, RV, V, VVB, B, BBG, BG, GBG, B, GYG, YG, YYG. The colors opposing each other are the contrasting colors. Another scale with the complementary slightly introduced into each color breaks the color and makes it more pleasing. For theatrical costumes clear colors and their complementaries with such ranges as yellow to red with opposing blue, or yellow to blue with orange, or blue to red with yellow and touches of black make charming effects. But here, color plays the most important part and "My Lady" is lost sight of while in the more closely related walks of life her face and character should be the most important factor. The effect of artificial light must be taken into consideration as yellow, varying in intensity as to whether it is candle, gas, electricity or lamp light, will enter every color, sometimes making it more brilliant while other times deadening it.

There are three blondes,—yellow, red, and brown—which we will term fair blonde, ruddy blonde, and semi-brunette; and two brunettes—brown and black—namely, pale and florid, with variations in all as to complexion and eyes.

The more delicate tones belong to the fair blonde as her coloring belongs to the upper part of the scale. The shadows of the hair show that soft tones of green are the most pleasing for this type, relieved with tones of the same scale of green, yellow green, orange, orange red, or red orange, somewhat of the autumn shades.

If the eyes lack brilliancy, and this is apt to be true of every type, the force of contrast should be brought into play by adding a deeper tone of the same color, a harmonizing color or black. The brilliant notes may be placed on the hat such as a tint of red, red orange, or orange red. Cream white and blue white must be considered in all types, the first being preferable if there is yellow in the skin, while it softens the color to the skin. Fine laces and gauzy materials are refining and should be employed by all small featured women. Blue is suitable if light and not too positive, but if dark is desired it must be separated from the skin by white. As blue approaches the neutral scale, warm or cold grays may be combined effectively. If very pronounced effects are desired, greens and reds and purples

are good tones to introduce. Black is effective in trimming and is suitable as a whole if there is an agreeable pink tint in the skin, velvet being preferred to a glossy material as the latter reflects too much light and detracts from the face.

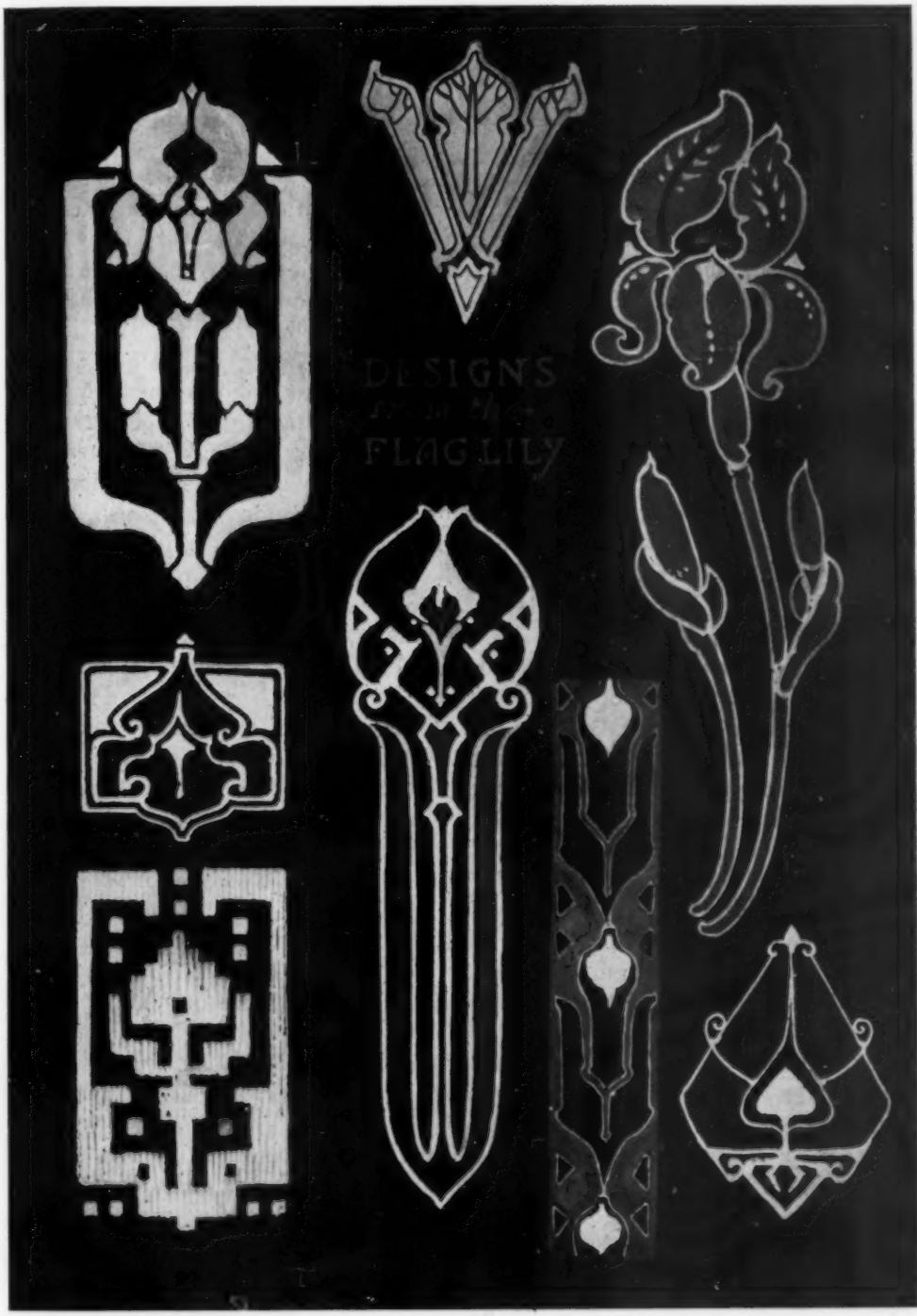
Warm and cool grays are suitable for gowns with broken tones used to brighten the effect. The ruddy blonde approaches the red scale in her complexion with warm brown hair and blue eyes. She may adopt the same colors as her fair sister but they must be deeper in tone. Her skin is not so delicate hence is less sensitive to colors. Middle blues inclining toward the green and gray scales are better than those inclining toward purple (blue being the complementary of the orange which exists in the hair). If her complexion is very ruddy then the neutral and broken colors are best suited to her. Violet is a difficult and trying color because it reflects yellow and tends to make the skin appear sallow; however, on the stage the effect is splendid with combinations of old gold and jewels. A rich violet velvet hat with a cream white velvet or crepe facing, and trimmed with yellow green leaves and old gold is a very beautiful frame for the Titian-haired beauty.

The first brunette has a pale skin that has a tendency to sallowness, with eyes of deep brown and hair of brown black. Here we have a contrast of white of the skin and black of the hair, hence light or dark colors are better than medium tones. White should be cautiously used and always cream white, because this type generally belongs to the yellow scale. Black with cream white is generally suitable. Blues must be broken because bright blues reflect orange. Warm hues of brown are good if two or three tones are combined, the lightest being gold color. In fact warm colors generally suit this type but colors of full intensity must be cautiously chosen. Deep reds and combinations of orange and purple and lighter tones of broken reds are favorable. The neutral yellows neutralize the yellow tints that exist in the skin. The type that comes in between the blonde and brunette has a grayish brown hair, gray-blue eyes and a sallow complexion so that her colors partake of both, with neutral or broken colors, which have yellow introduced.

The florid brunette has a skin approaching the olive scale with high color, eyes deep brown and hair jet black. This is the most commanding type of feminine beauty and may be found in daughters of mixed races; yellow predominates, which when used in costume neutralizes the yellow that may exist in the skin. The color half way between orange and green of the tertiary scale, neutralized yellow orange, and orange yellow, with orange will neutralize an over-amount of yellow in the skin. Red orange, orange red, red, and red violet must be cautiously introduced into the dress but would be effective in the hair or headdress. Dark red is good if the complexion is rich in red; and warm browns combined with orange, red orange and yellow greens should be broken slightly if color in refined effects is desired. Two or three broken tones of light reds used together often make a pleasing result. Cream white and glossy materials suit the present type but must be relieved by gold color and yellow.

As complexions and eyes vary with these types, more careful study of their characteristics must be made.

TEMPERA DRAWINGS MADE BY THE USE OF GRAY AND WHITE PAINT ON BLACK PAPER. THREE TONES INCLUDING THE BACKGROUND GIVE ALL NECESSARY VALUE DIVISIONS



DESIGNS MADE FROM THE FLAG LILY ON OPPOSITE PAGE WITH THE USE OF THE SAME TEMPERA PAINT AND WITH THE SAME VALUES

Editorial Page

THE DAY HAS COME

THE school term is ending. The material for exhibition is being assembled and happy expectations and concerned expressions appear here and there on students' faces. For the art department exhibition is looked forward to as "The Room" to see when the year's work is assembled. Some may go and nibble at the exhibits of the cooking class; others may take a businesslike delight in the perfection of the typewritten pages of the commercial class. But all that is real business, and the art class work is composed of interesting posters and colored designs that make a festive array on the walls. All year long the teacher has had an eye toward the end-of-the-year exhibition. It must be the center of attraction. It must make the principal and trustees "sit up and take notice." The president of the board is very keen on painted sofa cushions; therefore the exhibition will have a large group of just such problems on which the students were drilled for a month. And there will be the array of large posters. Who said high school students couldn't undertake big problems? The posters will disprove that.

And so down the line the walls will be covered with purely exhibition stunts, for the exhibition is to be the "proof of the pudding—" and the eating thereof is to be by the parents and school board who will come to see and admire. The aim of the teacher has been that of only pleasing the guests.

"Perspective problems? Why no! They look so mechanical and most people wouldn't know what they meant. Pencil drawing, pure draftsmanship? Why, if students had to do such work, there would be so few enrollments that the class would be impossible. Of course, you see the drawing is selective and we must give attractive subjects. Yes, the students should know how to draw well, and perhaps if they didn't do so many different things they could do fewer better, but then they're at such a restless age.

"And those designs—aren't they good! I know they couldn't ever be applied but what fun there was in making them. Yes, I know those are Austrian motifs and look strange for our materials but they're a little odd, you know, and students like odd things.

"Those are not tomatoes, my dear. Dahlias in still life. You see, we sacrifice drawing for color. This is an age of color in art and drawing is not nearly as necessary as it used to be."

What a rude dream! For no such comments are connected with the truly progressive art display. The conscientious teacher will gather her students to her Fountain of Art Truths and give them what is necessary for their sturdy growth in American art. For art education means not the skimming of problems, the whimsical sipping of this and that for amusement, but the steady delving into sincere branches of the science of art, working through the unattractive but necessary outer parts that the Pearl of Beauty may be revealed.

Let every art teacher review his year's work at some hour alone this year. View it and judge it as though it was some stranger's accomplishment. Has it fulfilled the most for the future needs of the students or merely the teacher's exhibition ambitions? Has a personal motive dominated the array of problems rather than the general need of art appreciation and art application in the community?

How human it is tor the zealot to think more of rites than of right and how much better it would be to have more heart work in our art work! So many of our studies are superficial; they have the appearance of—they are—veneered. They need deeply rooted connections with sure and sturdy growths in order that their branches, though many, may have sustenance and bear healthy fruits. And such a tree will be one of perennial delight to all. Mankind will call it Thoughtful Art.

Editorial News and Comments

VACATION SKETCHING. Vacation days are coming soon for a good many hundred teachers of art. Many vow that they will do nothing but bask in the sunshine, and watch the flowers grow and hear the birds sing—forget all that is connected with the pencil and brush. But at the end of ten days' relaxation the greater part will hear the call of art and will send home for their sketch kits and find recreation in the joy of working out of doors, when they wish and on what they like most. Happy hours to all such! May you find inspiration, vigor, and the "anointed eye" when working from nature. From nature has come all that is best in art. To nature must we return to be refreshed.

Vacation days will mean a brighter return to your duties where nature has taught a few more of her secrets. 'Tis a happy teacher who adds summer by summer to her portfolio in new sheets of thoughtful drawing or design. They are but concrete records of much that has been added to her knowledge. Two such sheets are those of the decorative pen and ink landscapes and the page of black and white landscape compositions reproduced in this number.

A REVIEW. As I review my files and reread the many letters of which busy days have prevented a more careful perusal, I am greatly pleased and encouraged with the many happy words of appreciation and commendation on the year's SCHOOL ARTS. From every state of the Union, it seems, the busy teacher has found time to write his gratefulness for the help and inspiration that the Magazine has brought to his work. I wish, therefore, right here to say to all those again whose good words have been acknowledged and to those whose letters may have been unanswered through the stress of a very busy year; that I appreciate very fully all your good words and hope that you will continue to tell the editor not only what you like about the Magazine but also what you think you would like to see the Magazine have. I received but one letter criticising the Magazine. This writer thought the Magazine was becoming a picture-book and should have more pages of solid reading matter The editor feels that the busy teacher

can best understand how to go about doing art and better understand what others are successfully doing in art by showing picture-making by pictures rather than attempting to do it in words. A page of illustration can tell what it takes three pages of type to say. It costs the publishers considerably more to say it in engravings than in type but they wish to give the greatest amount possible to the subscribers in the Magazine pages. What say you, dear subscribers? Will you have pictures or type? From which pages have you gained most during the last year? I am anxious to know.

A LITTLE FOLKS' PART IN THE NEXT VOLUME. With the next volume a section will be devoted fully to the problems and work of the kindergarten and grade teachers. Teachers have responded fully to the requests for ideas. The response has been so good that we can safely say that no other magazine will be so alive with things of interest to the little folks. And we want teachers everywhere to know that we appreciate immensely the importance of art for the little children and that we are welcoming work from teachers in all places, that we believe every teacher has achieved some new ideas worth while for our columns. You each know your best ideas—those that have been tried and found worthy—and that is the idea that you should send us for the Magazine.

WOULD YOU LIKE TO SEE a portion of the Magazine devoted to Reconstructed Drawings? There are drawings submitted many times that are good in parts and with the correction of other parts would be excellent. If such drawings could be shown corrected what a help it would be to the teacher or student. What teachers are willing to send material to be corrected and shown corrected without the name or source being given? Put up your hands and then down again, writing me a letter and saying so. I know artistic natures are sensitive ones, and no teacher wants it said in print: "Here is a drawing by Miss Jones' pupils; note the improvement shown in the corrected sketch." We really ought to be willing to have our work cut up and corrected mercilessly if we wish to progress, but a printed criticism may work injury where the purpose is not understood. But we can all be helped by corrected drawings and we all have designs or work that we take out once in a while and wonder what in creation is the matter with them—why it doesn't give us a happy feeling to look at them. Now it's these drawings or some of your students' drawings and designs that you want analyzed. We would like to receive them and will coax them, rearrange them, and even dissect them if necessary; then we will show the findings of our art laboratory diagnosis so that other teachers everywhere may know best how to control similar ailments in their work. This plan needs everyone's help. If everyone waits for the operation to be performed on their neighbors' problems, there won't be any operation.

HOW ABOUT A TRAVELING EXHIBITION? Teachers everywhere write, "Can you tell me where I can receive an exhibition of good school art work to help my pupils by seeing what others have done?" The Magazine receives every month a great deal of excellent work. Much of it is in color and the black and white engraving often loses a great part of the charm of the color design. If every supervisor would send ten of their best results, what a

high standard national exhibition the SCHOOL ARTS MAGAZINE could collect for a circuit exhibition. Such a problem needs to be a co-operative one. Where is the teacher in each state who will accept the chairmanship of the Exhibition Committee to collect one hundred of the best works representing art education in her state? We will arrange and mount the exhibit, we will title the work and arrange for its shipping from state to state—each exhibitor to pay the transportation charges to the next point of exhibition. Here's the chance to receive for a week's period the most comprehensive collection of school art ever shown in the United States. If but a few of the live readers of this magazine will do their part in their state! Let's start something now! Write for your part of the plan.

THE NATIONAL PRESS ASSOCIATION annual meeting is to be held this year at Salt Lake City, Utah, July 4th to 10th inclusive. A feature of the program will be the Congress of Boards of Education on Thursday, July 8—forenoon, afternoon, and evening. Theme: "Financing and Managing the Public Schools." Members of school boards, state, city and county superintendents, and educational experts will take part in the discussions.

The Congress will meet in two sections on Thursday forenoon, one section to consider rural school problems and the other to consider the financial problems of the city school. It will meet in one body Thursday afternoon and Thursday evening. Several eminent men and women have accepted places on the program. An interesting number of subjects have been arranged on the general program.

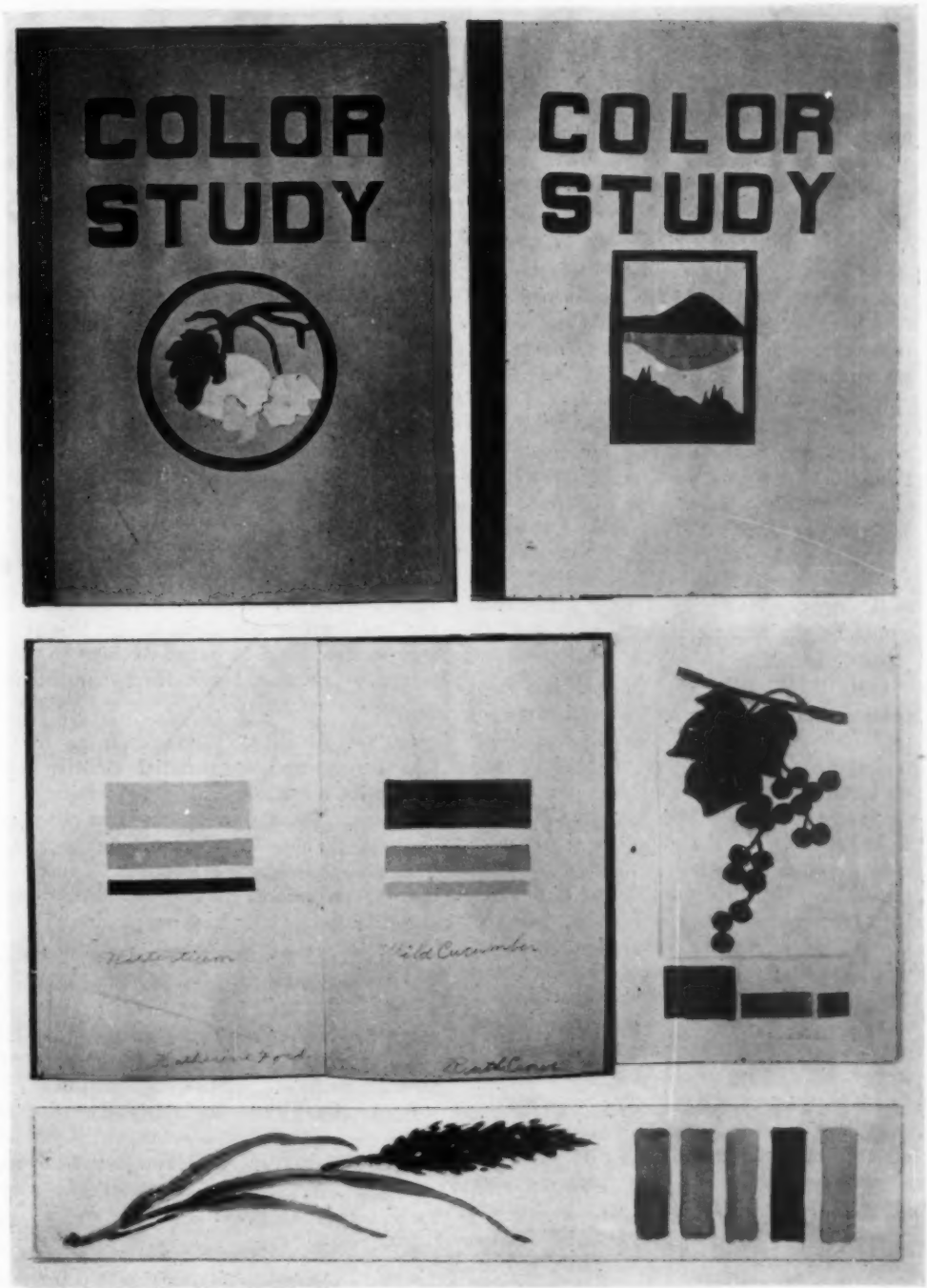
THE FOLLOWING is a little leaflet issued by the American Federation of Arts. It is so good that I reprint it so that everyone of our readers can read it. It's worth copying so that a few principals and hard-shelled neighbors (with which every village and city in our bright land is endowed) may read it also. Try it anyway.

WHY BOTHER ABOUT ART?

"Because a knowledge of Art can give you more pleasure than almost anything else. It can make you rich. It can give you a vista—and a vision. It reveals hidden beauty. It is like the window in the workshop that lets in the sunshine and gives a beautiful outlook—it makes life more worth while. It makes common things more valuable. A flower pot is worth a few cents, a bowl of the same clay a few dollars—a vase exquisitely formed and finely glazed or decorated sometimes hundreds of dollars. The difference between a kitchen chair and a Chippendale chair is a matter not of materials but Art. The cities of Europe are visited because they are beautiful—works of civic art. The artistic home is the one everyone would choose. The difference is a matter of choice—taste. If you want to know how you must know about art. Art is one of the few things in the world that is permanent—the art of Greece is still the glory of that great nation. So is the art of Italy, of France. And France, which is known as the most artistic of nations, has lately proved herself most valiant, most courageous, most enduring. Art is a factor in the civilization for which the Great War was fought and for which many gave their lives. It is for all. It enriches life, both for the individual and for the nation."

COLOR NOTATIONS SECURED FROM PLANT FORMS AND APPLIED TO TEXTILE AND COSTUME DESIGN. NATURE PRESENTS THE STUDENT WITH BEAUTIFUL HARMONIES

NATURE COLOR HARMONIES FOR THE HIGH SCHOOL ART PROBLEMS ARE WELL DEMONSTRATED IN THE ABOVE COLOR PLATE TAKEN FROM THE BOOK "APPLIED ART," THROUGH THE COURTESY OF THE PUBLISHERS, THE PACIFIC PRESS PUBLISHING ASSOCIATION, MOUNTAIN VIEW, CALIFORNIA



COLOR STUDY BOOKLETS AND PAGES OF COLOR NOTATIONS BY THE STUDENTS OF THE BOISE, IDAHO SCHOOLS, MISS BLANCHE CAHOON, ART SUPERVISOR

Good Ideas from Everywhere

TEACHERS EVERYWHERE ARE INVITED TO SEND IN ORIGINAL IDEAS AND ALPHABETICON MATERAIL FOR THIS DEPARTMENT. THE EDITORS ARE GLAD TO CONSIDER ANYTHING SUBMITTED AND WILL PUBLISH IT IF POSSIBLE. HELPS FOR THE GRADE TEACHERS ARE ESPECIALLY DESIRED.

CHILD SCHOOL DAYS CALENDAR. The calendar pages, appearing in this month's magazine, by William S. Rice, are the beginning of a complete series for the year's calendar to appear through the next volume. These pages present subjects of interest to the little folks, accompanied by a verse pertaining to the month. The drawings by Mr. Rice are excellent pen renderings and are worthy of filing in any teacher's reference material as examples of clear pen and ink renderings with a decorative quality. They make also excellent material for coloring. They contain strong outlines within which color will look well. An excellent problem for a school class would be the making of a calendar and the writing of a verse to accompany it.

COLOR BOOKLETS. One of the most enjoyable problems in color for small or grown-up folks is that of Color Notation. One of our pages show reproductions of Color Study booklets, and some of the pages from these made by the pupils of Miss Blanche Cahoon of Boise, Idaho. Ruskin stated those who love color the most are the purest and most thoughtful minds. If children are taught to find the color harmonies in nature and are interested by the teacher in copying them, they are being taught purity, thoughtfulness, harmony, and utility. One of the most valuable and needed steps in child education is a true knowledge of color. Not the color knowledge of complicated theory, but the joyous relation of color to the things that grow and live in the child's world.

ART SUMMER SESSIONS are good ideas and are helpful institutions for the teachers everywhere. There are not many summer schools that can claim to be profitable enterprises. They really fill in a breach and merely keep school equipment occupied during months that formerly remained idle. Every teacher who can consistently do so should attend it conscientiously and thoroughly and with a receptive and open mind. Some teachers try to flit from one summer school to another, all in the same summer, hoping to skim the cream of whatever ideas have been developed in all of them. Others fear to show what they don't know, and avoid working problems, prefering to attend only lectures. They are auditors and remain auditors always. Be a willing worker,—assume that you know nothing. Be a helper,—helping your neighbor whenever you can. Be cheerful about doing a problem over, even if you did one like it once before in a life time. People attend summer school to learn something more. Go as a student—not as an authority. Prove by work what you can do. And if you wish to know of the best summer schools in session this year, they can be found in our advertising section. Select the one nearest to you and your summer will be a profitable one.

COLOR AND COSTUMES. In my files I find two groups of material showing the adaptation of flower colors to textiles and costumes. These are reproduced on the page opposite the one of Color Study booklets. They are excellently worked out and I am sorry that as no teacher's name or address was attached that such credit is not possible.

COLORED PAPER CUT-OUTS give the greatest amount of pleasure combined with art knowledge for little folks. One of our colored pages illustrates paper cut-outs of birds and fishes. Brillancy of color and simplicity of form are both obtained by paper cutting.

Illustration by this method is shown in the pages accompanying the story of "The Dragon's Teeth," received from Ruth E. Jones of Buffalo, N. Y. The story that goes with the picture is as follows:

THE DRAGON'S TEETH

"While playing in a flowery field, Europa's brothers left her to pursue a butterfly. A snow-white bull came playing around the child and knelt to take her on its back. She

mounted him and rode slowly around the field. Suddenly the bull plunged into the sea and swam out of sight.

Cadmus, Europa's brother, with a band of followers set out in search of her. One by one his companions left him. At last, he went to consult the Oracle at Delphi. It told him to follow the cow and where it lay down to build a city. He soon came upon a cow which rose and walked before him. A group of people gathered around Cadmus and came, too. The cow stopped near a spring of water.

Upon going to the spring, Cadmus's followers were horrified to find it guarded by a huge, fierce dragon. Cadmus slew the dragon, and then heard a voice saying, "Take out the teeth and plant them in the ground."

From the teeth sprang an army of grim warriors. Warned by the voice, Cadmus threw a stone into the midst of the armed host, whereupon they fell upon one another and fought until only five were left.

Cadmus ordered these to come and build his city. A wonderful palace spring up over night. In the palace, Cadmus found Harmonia, who was to take the place of his sister, friends and all the loved ones he had lost. They lived happily and ruled the city for many years."

1. The children discussed the story and picked out the parts that would make interesting pictures.

1. Europa in the flowery field.
2. Europa on the snow-white bull.
3. Cadmus at Delphi.
4. Cadmus fighting the dragon.
5. The magic palace.

2. We talked about interesting space divisions and the center of interest.

3. Each child chose the picture he wished to make. He made a pencil plan of his picture showing space divisions and location of important details.

He made a list of the things he intended having in his picture and chose a color for each.

Sky—orange.
Mountains—purple.
Ground—green.
Palace—white.
Trees—black.

4. A pattern of a dragon was supplied to those who wished it. On the blackboard were drawings of Cadmus, Europa, trees, flowers, and a palace. The children were encouraged to originate designs for flowers, trees, etc.

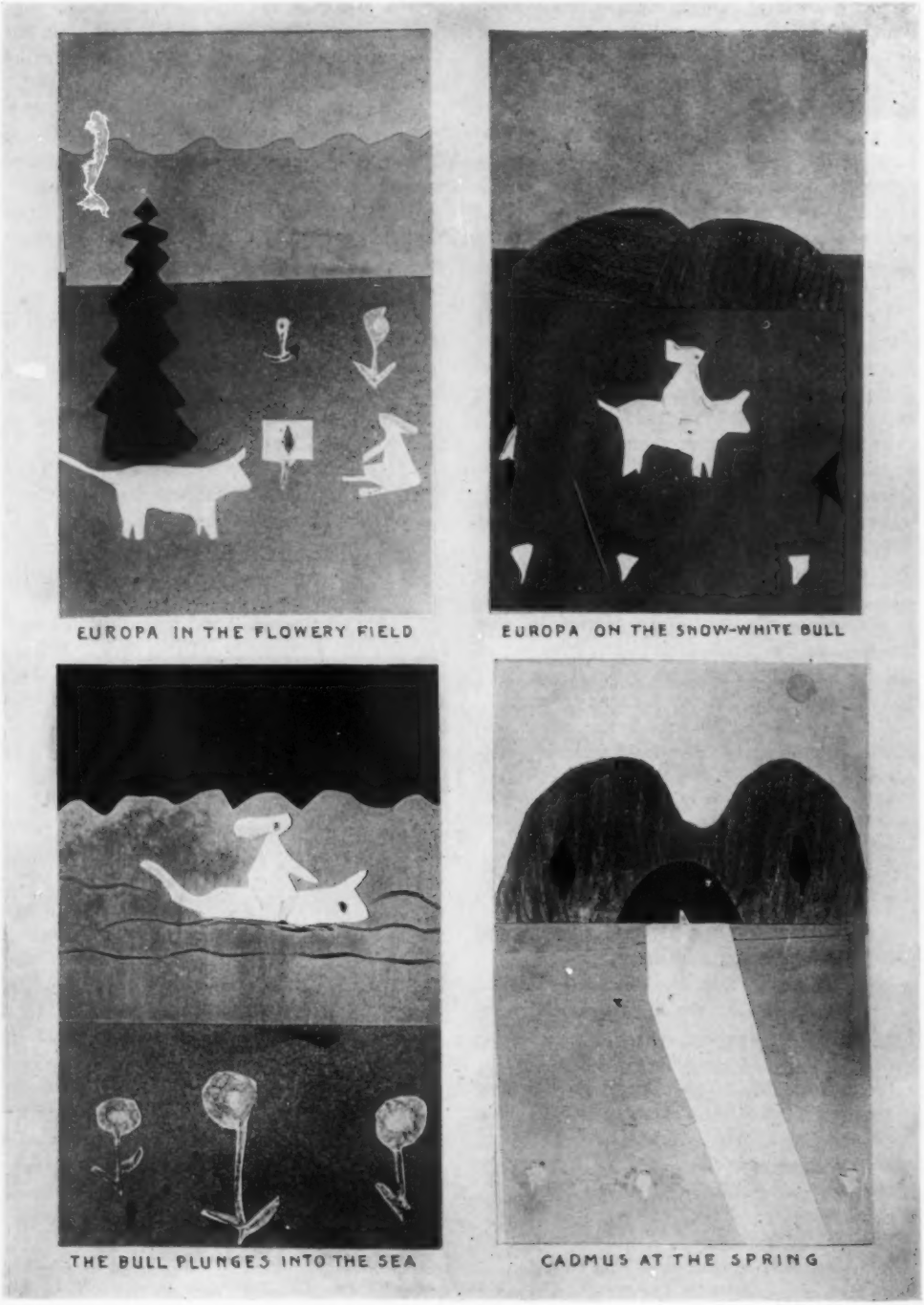
From colored poster paper, the children cut the proper shapes and assembled them to make a picture.

CLEVER "CUT-UPS" of silhouetted, bi-symmetric figures were sent by Grace Cheney of Washington, Vermont, as suggestive material for use in the grades in connection with posters, etc. These bi-symmetric cuttings appeal to the children who are able to cut them successfully and enjoy using them with cut paper letters in advertising school activities, etc. The two pages reproduced in this number show with what excellence the scissors may be used in working subjects related to geography or history. A few figures cut out at the same cutting would work out very well for use on posters or booklet covers.

STENCILLED PANSIES BRIGHTEN RED CROSS HUT. The American Red Cross Recreation Hut in Coblenz is now known as "Pansy Bower," all owing to the efforts of Miss Alice Dennis, a New York interior decorator, and Miss Mabel Scott, who have expended all their skill and ingenuity in transforming the hut into what it now is. Friezes of gay purple and mauve blossoms, stamped on the rough burlap wall coverings, and the pansies which blossom everywhere—on the table covers, the flower boxes and the sofa cushions—have made coming into "Pansy Bower" from the gray cold streets of Coblenz like stepping from winter into spring.

Despite its air of luxury, "Pansy Bower" entailed no expenditure of money. The burlap which covers the walls came to Germany on the outside of parcels and boxes. Cleaned and stamped with original designs in the brilliant German dyes, it looks like the product of some exclusive Fifth Avenue shop. The table covers are hospital pillow slips stencilled in the same way, while the dainty white furniture, flower boxes and window seats, were, not so long ago, merely rough wooden crates containing Red Cross supplies. From the Army junk heap, hanging lamps and demountable bookcases have been salvaged, cleaned, and painted, and now add their note to the comfort of the hut.

The formal opening of "Pansy Bower" took place on Christmas Day. All the patients of the Army Hospital in Coblenz had gifts, and there was a gramophone concert in the evening.



ILLUSTRATED STORY PICTURE, MADE BY SCISSOR CUT-OUTS BY THE CHILDREN OF BUFFALO, NEW YORK, MISS RUTH E. JONES, TEACHER

CADMUS AT THE SPRING

CADMUS KILLS THE DRAGON

THE MAGIC PALACE

THE CHARM OF THE COLORS USED IS LOST IN THESE BLACK AND WHITE ENGRAVINGS, BUT THE CHILD'S DIRECT ARRANGEMENT REMAINS. THE STORY IS GIVEN IN THE GOOD IDEAS DEPARTMENT

June

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

AMONG THE HOLLYHOCKS

As grandma walked among the flowers
The village bells were ringing.
And baby nestled in her arms
And clear the larks were singing.

Among the posies sweet and gay
The butterflies were resting
High on a plum tree overhead
Some noisy birds were nesting.

And baby crowed with all his might
The bees hummed through the bowers
How soothing are the summer sounds
One hears among the flowers!

SCHOOLDAYS CALENDAR BY WILLIAM S. RICE, HEAD OF ART DEPARTMENT, FREMONT HIGH SCHOOL, OAKLAND, CALIFORNIA

July

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

THE FOURTH

The cannon roars the crackers snap
And children laugh and chatter.
Old horses shy, the dogs all howl
The Fourth 's all noise and clatter.

High in the trees the locust sings
His notes sound harsh and wheezy.
The children seek the shady spots
They're apt to find more breezy.

The sky is darkening in the west
And angry storm clouds glower
I never yet have seen a Fourth
Without a thunder shower.

ILLUSTRATION 2 CALENDAR DESIGN

August

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

THE MILL POND

What blissful days were those when we
Went angling by the channel!
We fished for carp with scraps of dough
For frogs we used red flannel.

Familiar types we'd see each day
Old cronies, Sam and Henny,
Some days we'd get a bite, or two
And others, scarcely any.

You'd think the fish would all be caught
By fishing in all weather
Surprising too, it is, the fad's
Not died out altogether.

TRICHROMATIC HALFTONE PHOTOENGRAVING
YELLOW, RED AND BLUE

YELLOW AND RED

RED AND BLUE

BLUE AND YELLOW

A THREE-COLOR HALFTONE OR TRICHROMATIC COLOR PLATE MADE BY THE CARLTON ENGRAVING CO. OF WORCESTER, MASS., ENGRAVERS FOR THE SCHOOL ARTS MAGAZINE AND ENGRAVERS OF PLATES USED IN THE PRINT PROCESSES ILLUSTRATED IN THE MAGAZINE.

School Arts Magazine, June 1920

Our Color Pages

THROUGH the co-operation of various publishers and concerns, this color number of the MAGAZINE presents its readers with a number of pages in color. These not only demonstrate the reading matter but are excellent examples of the art of color engraving and printing of the American printer. Some of the inserts, it will be noted, are from the Pacific coast while others have been printed in the Central States and others in the Atlantic states. The whole number has been compiled from contributions of the East and the West, the North and the South; it is a national offering to the lovers of color.

THE ART OF COLOR ENGRAVING by the American Engraving and Color Plate Company of San Francisco, California, presents four pages on the subject. Both article and illustrations are so clear that the process of color engraving need no longer remain an unsolved mystery to the student of illustration. To enter the excellently equipped departments of the American Engraving and Color Plate Company and to see arrayed the many color subjects upon which the operator, the etcher, and the finisher are working is like visiting a magic workshop. For here the bright lights and skilled hands directed by color-trained eyes develop onto warm toned copper plates images which multiply the color painting a thousandfold, that it may reach into every part of our land. Isn't that magic?

It's a great benefit to school annuals to have their engravings made by engravers who are interested in the artistic production of school engravings. That the American Engraving and Color Plate Company is just such a concern is proved by the fact that it has engraved for a number of years the *Blue and Gold*, the large, University of California annual published each year and considered the handsomest annual publication issued on the Pacific Coast.

THE COLOR NIGHT SCENE is a reproduction from a painting made by the use of Pastello crayons manufactured by the American Crayon Company, of Sandusky, Ohio. To those who have used the crayons, their responsiveness and capacities are not new. To those who haven't, let me say that you have missed half the joy of outdoor sketching. A row of good colors in a handy pocket box, a small pad and you're fully equipped. You see a brilliant sunlight and cloud shadow effect and in a minute you catch it with the crayons on your pad. Water color and oil equipment would have required preparation; the fleeting effect would have gone before you could have caught it. You can't put a long time on a subject if you want to with crayons, because it is finished before you know it. And to work with the Pastello crayons of the American Crayon Company is to work with sticks of delight.

COLOR BOOKPLATES AND HOLIDAY DESIGNS are from that excellent portfolio, "Applied Art," published by E. K. Ferenz of New York City. This portfolio contains fifty plates $10\frac{3}{4}'' \times 13\frac{3}{4}''$ excellently printed designs in from two

to five colors. It is the kind of publication that calls forth the question, "Where can I purchase a set like that?" It's the kind of collection that in previous years could have been secured from abroad only. Mr. Ferenz has issued a series of subjects that are of use to the American worker, student, and teacher in art. Where the imported volume contained material one-half of which was of use to American workers, the portfolio issued by Mr. Ferenz has fifty good subjects, every one of them adaptable to American art. We do not hesitate paying a dollar apiece for color prints such as are contained in "Applied Art," but this portfolio gives fifty plates for a quarter of that price—the whole enclosed in a durable portfolio. In addition there are special articles written by Heyworth Campbell, M. D. C. Crawford, J. Cotton Dana, and H. A. Weissberger to accompany the illustrations which represent the work of more than thirty artists.

COLOR ADVERTISING may be in good harmony and pleasingly composed. Many advertisers are so anxious to compel the attention of their prospective clients that they destroy good harmony of color and space composition in the effort. The color page insert showing the advertisement by the National Motor Car and Vehicle Corporation of Indianapolis is an excellent example of artistic, good color advertising that presents a pleasing page and tells the merits of the goods advertised in the best way. American art history can never be written without including a prominent place for advertising art. Many have been the pages given to expensive colored advertisements, but few are there that will live when the test of harmony is brought to bear on them. Of the few, pages like that of the National Motor Car and Vehicle Corporation will be included.

TEXTBOOK COLOR PLATES by the Pacific Press Publishing Association of Mountain View, California, are from the book, *Applied Art*, a publication on drawing, painting, design and handicraft written for students and teachers by Pedro J. Lemos. This book, long delayed, is now being finished in the bindery and will contain forty color plates besides more than three hundred other illustrations. The advantages and helps issued toward the assistance of art teachers and advancement of American art in the present day leaves very little excuse for any teacher to go without sufficient guidance in reading matter. The plates shown in the Magazine very truly represent the colors of the originals and illustrate a color problem for the grades and one for the high schools. This book will add another much needed volume written in easily understood terms for the beginner as well as the more advanced student.

THE PIPER COLOR PAGE by the Carlton Engraving Company of Worcester, Mass., explains in a very clear way the process of trichromatic printing. It shows the combination of yellow, red, and blue plates to give green, orange, and violet hues through superimposition of the three primaries in varying proportions. Any engraver can make a copy of a drawing or photograph but it's another thing to retain all the values and line details. If any of the contributors have been surprised because their drawings have come out better than they expected, they owe their surprise to the Carlton Engraving Company.

The Art of Color Engraving

H. J. Griffith
American Engraving and Color Plate Co.
San Francisco, Cal.

THE reproducing of color subjects by the photo-engraving process is science's greatest achievement in print making. By the combination of photography and engraving, the multi-colored rendering made by the artist from an unlimited color palette is engraved and reproduced by three or four copper engravings.

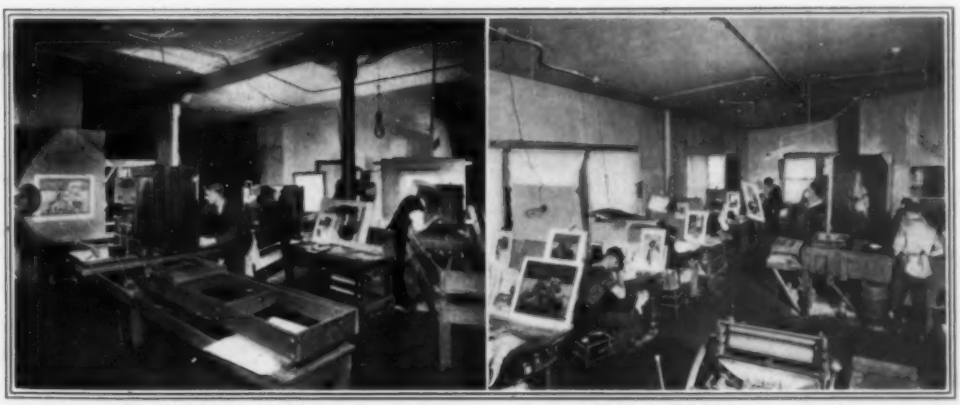
This sounds like magic, but magic it is—the magic of perfect craftmanship and art, for art enters into every mechanical operation of the process. For while the development of the subject from the negative to the finished proof has its definite formula and procedure, let the workman with the untrained eye for color faithfully follow every rule prescribed and his production will be found wanting. Each step of color engraving demands the skilled hand and color-sensitive eye to match and catch the slightest difference of the hues, their values and intensities.

The process of color engraving is based on the fact that by the proper mixture of the three pigments, yellow, red and blue, any shade of color may be matched. In practice the colors are secured by engraving one plate to print all the yellow of the subject, another to print all the red and a third to print all the blue. A fourth plate is used which prints all the blacks and neutral tones.

When a picture or subject is received to be reproduced by the three or four color process, it is placed before the camera and, after focusing to the desired dimensions, the operator proceeds to secure a negative for each of the primary colors as well as a plate to record the neutral tones.

Each negative is made on a photographic plate which is sensitive according to the color it is to record, and with the aid of filters of transparent colored glass placed behind the lens, the action on the plate of the particular color for which the negative is made is retarded or entirely prevented. Each negative, although not colored, records the values and graduations of the color, and, from these negatives, plates are made which are printed in that color.

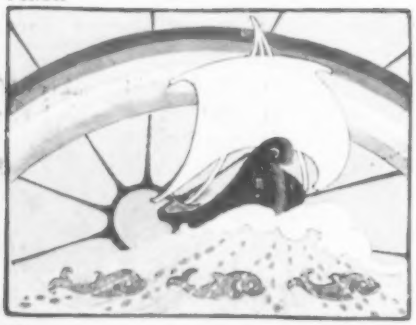
The photographic plate used for the negative of the yellow printing plate is sensitive to red and blue. A purple filter (A) retards the action of all colors except the yellows. A green filter (B) is used in the same way to secure the negative for the red printing plate, and a red filter (C) accentuates the action of the blue rays on the plate, resulting in a plate to print the blue of the subject. In the four color process a photographic plate is used which is sensitive to all colors, a yellow filter (D) intensifying the action of black and gray. This plate records only the blacks and neutral tones.



OPERATING ROOM

COLOR ETCHERS AT WORK

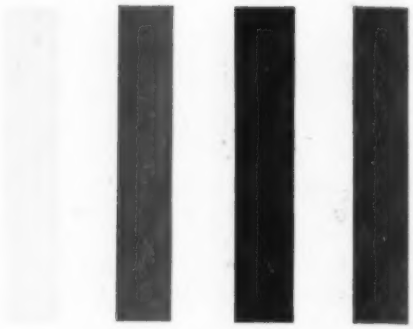
Yellow



Red

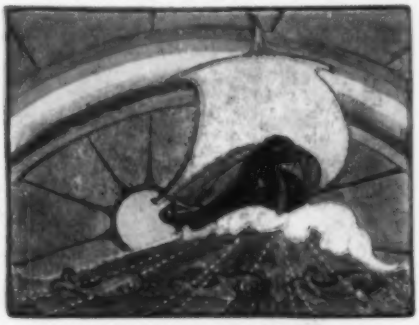
Black

Blue

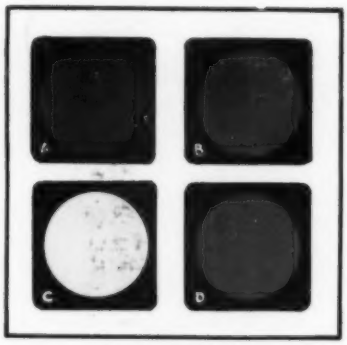


Yellow and Red

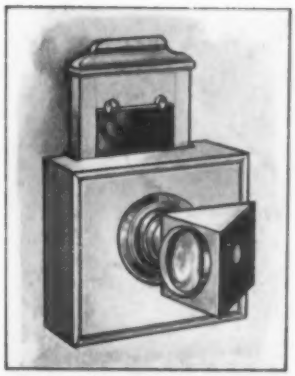
Yellow, Red and Black



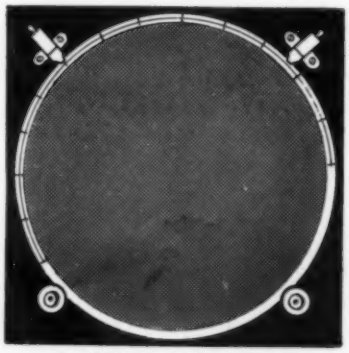
Yellow, Red, Black, and Blue



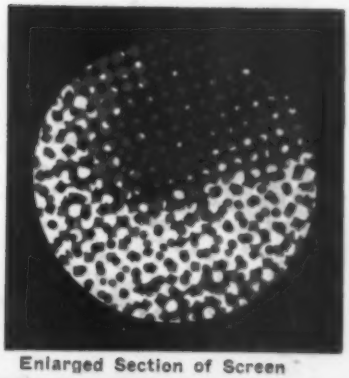
Color Filters



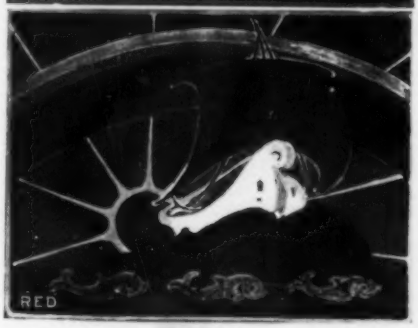
Prism, Lens, and Filter



Screen and Holder



Enlarged Section of Screen



Separation Negatives

Through the discovery of special photographic dyes which are mixed with the emulsion of the sensitive plate, these color separation negatives can be made very nearly correct. A certain amount of handwork, however, must be done to improve and correct them. This work is done later on, after these negatives have been transferred to metal by the re-etcher and finisher. Here the re-etcher or finisher must call to his aid all his artistic knowledge, for the correction of a hue or strength of color must require absolute knowledge of where the fault lies. Some part of one of the color plates must be burnished to print darker or re-etched to be lighter, and the right amount requires expert experience.

In order that the surfaces of the printing plates will have relief, a half-tone screen is placed in the camera which introduces a mesh or screen of multiple dots and lines throughout the subject. This screen is a plate of crystal glass ruled with parallel lines of equal thickness which cross each other at an angle of 90 degrees and are engraved in the surface of the glass plate and blackened, while the spaces between remain transparent. It was through the invention of this screen that the half-tone process became possible. When each negative for the separate colors is made, the half-tone screen is turned a few degrees so that the half-tone dots will not fall exactly on top of each other in the printing. In order to obtain the best results, the dots must print as nearly as possible upon the paper which has been left uncolored by the previously printed color. The angle at which the screens cross each other are of great importance, for if incorrect they will create a pattern which would destroy the appearance of the picture.

The negative is next prepared to come in contact with a sensitive coated copper plate in a printing frame and exposed to the intense rays of a powerful arc lamp. It is necessary that the contact between the plate and negative be absolute, and often vacuum pressure is used to secure this.

After proper exposure the plate is removed and immersed in water and developed. It is then dried and heated until the sensitive coating becomes a dark brown enamel. This enamel resists acid into which the plate is next placed, and the open parts between the small lines and dots that make up the subject are etched away leaving the subject in relief.

During the etching the workman must "stage," or cover, the different parts that have been sufficiently etched until right tonal qualities are secured. Upon the completion of this part of the work, which often requires days to finish, the plates are mounted on type high wood or metal bases and proved to see that the color results are correct. Often after corrections they are proved again and then sent to the printer for final printing.

By this process, briefly described, color engravings are made with a few plates superceding former color printing methods that required twelve and twenty printings. The huge saving in labor and time and the greater possibility of true color reproduction have been of great value to the art world.

PROOFERS

ROUTING